Service Manual
(For Human Use)

vieworks

Revision history

Revision	Date	Descriptions
1.0	2011-11-25	Initial Release
1.1	2011-12-01	• Modified ▫ Network Interface card specifications (p22) ▫ Detector Specification (p23) ▫ EXT_INF port pin description (p36) ▫ Input and Output circuits diagram (p37) ▫ Offset Calibration (p79) ▫ Defect Correction (p80) ▫ Numbering for Chapter (p72 – p108) • Added ▫ Default value for EXP OK Delay section (p77) ▫ Gain Type Setting (p78) ▫ Prerequisites for configuring the detector (p73), Gain Pixel Correction (p81)
1.2	2012-02-20	• Modified ▫ Detector Connection(p75) ▫ Figures (p93-p94) • Added ▫ Detector Configuration(p84) ▫ Diagnosis(p85)
1.3	2012-06-08	• Added ▫ Fuse Specification and replacement procedure (p37)
1.4	2012-08-09	• Added ▫ Extension Facility (p23 – p24) ▫ Disabling Windows Sleep Mode (p87 – p90) ▫ Failure Case (p137 – p139) • Modified and Added ▫ Trigger Mode (p41 – p43) ▫ Miscellaneous (p26, p56, p97, p119)

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Safety and Regulatory

Safety Notice

The following safety notices are used to emphasize certain safety instructions. Follow the safety instructions in this manual along with warnings and cautions symbols. Ignoring such warnings or cautions while handling the product may results in serious injury or accident. It is important for you to read and understand the contents of this manual before attempting to use the product.

Symbols	Descriptions
	Indicates a potentially hazardous situation which will cause death, severe personal injury or substantial property damage if the instructions are ignored.
	Indicates a potentially hazardous situation which may cause minor personal injury or property damage if the instructions are ignored.
	Provides additional information that is helpful to you. It may emphasize certain information regarding special tools or items to check before operating the product.

Safety Information

This product is designed and manufactured to ensure maximum safety of operation and to meet all the safety requirements applicable to electronic medical equipment. However, anyone attempting to operate the system must be fully aware of potential safety hazards. It should be operated and maintained in strict compliance with the following safety precautions and operating instruments contained herein:

	Caution: Federal law restricts this device to sale by or on the order of a physician or a licensed practitioner.
	Always be alert when operating this device. If a malfunction occurs, do not use this device until qualified personnel correct the problems.
	The product should be installed, maintained and serviced according to Vieworks maintenance procedures and by Vieworks personnel or other qualified maintenance personnel approved in writing by Vieworks. Operation and maintenance should be done in strict compliance with the operation instructions contained in the manuals.
	The system, in whole or in part, cannot be modified in any way without written approval from Vieworks.
	Before authorizing any person to operate the system, verify that the person has read and fully understand the Service Manual. The owner should make certain that only properly trained and fully qualified personnel are authorized to operate the equipment. An authorized operators list should be maintained.
	Prevent unauthorized personnel from access to the system.
	It is important that this Service Manual be kept at hand, studied carefully and reviewed periodically by the authorized operators.
	The owner should ensure continuous power supply to the system, with voltage and current according to the product specifications. If power failures are frequent, an Uninterrupted Power Supply (UPS) should be installed to avoid loss of data.
	If the product does not operate properly or if it fails to respond to the controls described in this manual, the operator should immediately contact Vieworks field service representative.
	User must not contact a fuse holder or contacts of connector (ex: Inlet connector) with a patient simultaneously during operating the equipment and not allow patient to touch the fuse holder or contacts of connector.

	The images and calculations provided by this system are intended to be used as tools for the competent user. They are explicitly not to be regarded as a sole incontrovertible basis for clinical diagnosis. Users are encouraged to study the literature and reach their own professional conclusions regarding the clinical utility of the system.
	The user should be aware of the product specifications and of the system's accuracy and stability limitations. These limitations must be considered before making any decision based on quantitative values, in case of doubt, please consult a Vieworks representative.
	Do not install the equipment in a location with the conditions listed below. Otherwise, it may result in failure or malfunction, fall or cause fire or injury. • Close to facilities where water is used. • Locations exposed to direct sunlight. • Close to air-conditioner or ventilation equipment. • Close to heat source such as a heater. • Prone to vibration. • Insecure place. • Dusty environment. • Saline or sulfurous environment. • High humidity. • Ambient temperature is higher than the operating temperature stated in this Service Manual.
	Occasionally, this product may have defect pixels caused by TFT characteristics. When the defect pixels are found, perform the Defect detection. For details about how to correct defect pixels, refer to 5.3.2 Defect Correction.
	Do not inflict excessive shock and mechanical vibration. Otherwise, it may result in poor image quality caused by noise.
	Do not unscrew or loosen the screws on the detector surface since all the screws are secured properly at the time of shipment. Otherwise, it may result in poor image quality or damage to equipment.
	This product may malfunction due to electromagnetic interference (EMI) caused by telecommunication devices, transceivers, electronic devices, etc. To prevent the electromagnetic wave from badly influencing the product, be sure to avoid placing it in close proximity to the product. Or, change direction or position of the product or move into the shielded place to reduce electromagnetic interference.
	To reduce the risk of electric shock, do not remove cover. No user-serviceable part inside. Refer servicing to qualified service personnel.

General Hazards

Radiation Hazards

This system can be connected to x-ray generating equipment. Be certain to follow the safety instructions and specifications for wearing proper lead apron when x-ray exposures are planned or possible.
All personnel should wear protective equipment including dosimeters during all phases of installation, operation and maintenance of the system.

Electric Shock Hazards

To reduce the electric shock hazard, the system must be connected to an electrical ground. A three conductor AC power cable is supplied with this system to provide the proper electrical grounding. The power cable must be plugged into an UL-approved three-contact electrical outlet.
Do not disassemble or modify the product as it may result in fire or electric shock. There are no operator serviceable parts or adjustments inside the systems. Only trained and qualified personnel should be permitted access to the internal parts of the system.

Explosion Hazards

Do not operate the equipment in the presence of flammable or explosive liquids, vapors or gases. Do not plug in or turn on the system where hazardous substances are detected.
If flammable substances are detected after the system has been turned on, do not attempt to turn off the system or unplug it. Evacuate and ventilate the area before turning the system off.

Implosion Hazards

Do not hit or drop the equipment. The equipment may be damaged if it receives a strong jolt, which may result in fire or electric shock if the equipment is used without it being repaired.

Owner’s Responsibility

The owner is responsible for ensuring that anyone using the system reads and understands the Service Manual and other relevant literature, and fully understands them. Vieworks makes no representation, however, that the act of reading this manual renders the reader qualified to operate, test and calibrate the system.

	Do not use the system if unsafe conditions are known to exist. In case of hardware failure that could cause hazardous conditions (smoke, fire and etc), turn the power OFF and unplug the power cords of all sub-systems.

Notes for Using the Equipment

System Diagnostic

The ***ChameleonSetup*** software runs a system diagnostic. Run ***ChameleonSetup*** software after installing the system and at least once a year. If an error occurs, report the detailed error information to Vieworks local dealer or distributor.

CAUTION	The owner is responsible for ensuring that the system diagnostic is performed every year. Do not try to use the system if the system diagnostic is failed.

Calibration

To ensure optimal performance of the system, it is important to verify that the system is calibrated.

CAUTION	The owner is responsible for ensuring that the system calibration is performed after the system installation is completed or the system is repaired. Do not try to use the system if system calibration is not performed.

Distances measurements

Distances measurements in millimeters are possible only after distance calibration has been performed using a reference object (refer to QXvue User Manual).

CAUTION	The operator is responsible for performing distance calibration with a reference object and verifying the results of the distance calibration before taking any distance measurements on an image.

Left/Right Marker

The operator is responsible for the correct and clear marking on the left or right side of the image to eliminate possible errors.

The software includes an option to mark the image with L (left) or R (right) indicator from acquisition phase through printing and archiving. If the operator chose, for any reason, not to use L/R markers, he must use an alternative way to eliminate any possible mistake.

Image Backup

To avoid missing images which might result in patient being exposed to additional doses of radiation, it is important to backup the images by filming or by using a CD or DVD option. This should be done as a routine operation for every patient.

If the hard disk of your workstation is about to full, the operator should backup images and delete the images to make room on the hard disk for new patient.

User Limitations

The QXvue software has the technician mode which could only be operated with the inputting PASSWORD. The technician mode should be operated by the personnel who are qualified by Vieworks.

Cleaning the System

Use a dry cloth to clean surfaces of the system. Do not use detergents or organic solvents to clean the system. Strong detergent, and organic cleaners may damage the finish and cause structural weakening. Do not clean the system with turning the power on.

Disposal

Disposal of this product in an unlawful manner may have negative effects on health and on the environment. When disposing of this product, therefore, be absolutely sure to follow the procedure which is in conformity with the laws and regulations applicable in your area.

	The expected life span of ViVIX-S system is about 3 years.

Overheating

Do not block the ventilation ports of the detector to prevent overheating of the detector. Overheating can cause system malfunction and damages.

Electrical fire

- This equipment is not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- Conductive fluids that drain into the active circuit components of the system may cause short circuits that can result in electrical fire. Therefore, do not place fluids or food on any part of the system.
- To avoid electric shocks and burns caused by use of the wrong type of fire extinguisher, make sure that the fire extinguisher at the site has been approved for use on electrical fires.

Handling the Equipment

The Equipment must be handled with care to avoid personal injury or damage to the internal image sensor.

CAUTION	• Do not put pressure on the detector locally since it will cause permanent damage to the internal image sensor. • Excessive weight on the equipment may damage the internal image sensor. • It is recommended to use the case, in case if a patient should be positioned to put pressure on the detector while acquiring images.

Load Limit	Specifications
Uniform Load	150 kg over the whole area of the detector surface
Local Load	100 kg on an area 40 ㎜ in diameter

Pediatric Application

- Every request should be reviewed by the pediatric radiologist prior to beginning the examination to insure correct study is being performed.
- If the technologist notices an unusual request, they should contact the pediatric radiologist. An example should be from pediatric clinic where they order a Full Cervical, Thoracic, and Lumbar Spine series. The pediatric radiologist should contact ordering physician and decide which study is the best for this pediatric patient.
- The technologist should use the proper technique for the patient's size to decrease the radiation dose when the technologist acquires diagnostic images.
- ALL Pediatric patients shall be shielded for their x-ray examinations, except for when the shield will obscure the region of interest, as in a pelvic or SI joint xray for trauma or arthritis, or when it is physically or clinically unreasonable to shield the patient. For routine Hip X-Rays, ALL male children shall have their scrotum shielded using the small gonadal shield, females may not be shielded as this would obscure the hips.
- To minimize motion in infants and young children, swaddle the infant. Use distraction tools to improve cooperation and projectors with child-friendly themes, music, toys with flashing lights or music, child-friendly images on the ceiling or walls, singing, counting, and a parent reading and talking to the child through the console all can help reduce anxiety and comfort the child.
- A Scoliosis series will consist of a single frontal standing view of the spine. No lateral view or supine view is needed, unless specifically asked for by the Orthopedist or Radiologist. If the female's breasts can be shielded without obscuring the spine, breast shields should be used.

Regulatory

Medical Equipment Classifications

Type of protection against electrical shock	Class Ⅰ equipment
Degree of protection against ingress of water	IPXO
Mode of operation	Continuous operation
Flammable anesthetics	NOT suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Equipment Standards

IEC/EN/UL 60601-1	Medical electrical equipment
CSA C22.2 No. 601.1	Part 1: General requirements for safety
IEC/EN 60601-1-2	Medical electrical equipment Part 2: Electromagnetic compatibility–requirements and tests

Guidance and Manufacturer's Declaration for EMC Directive

This device has been tested for EMI/EMC compliance, but interference can still occur in an electromagnetically noisy location. Attempt to maintain a suitable distance between electrical devices to prevent malfunction.

Electromagnetic Emissions

The Equipment Under Test (EUT) is intended for use in the electromagnetic environment specified below. The customer or user of the EUT should assure that it is used in such an environment.

Immunity Test	Compliance	Electromagnetic Environment – Guidance
RF Emissions CISPR 11	Group 1	The EUT uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	The EUT is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ Flicker emissions IEC 61000-3-3	Complies	

Electromagnetic Immunity

The EUT is intended for use in the electromagnetic environment specified below.

The customer or user of the EUT should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ± 1 kV for input/output lines	±2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle. 40% U_T (60% dip in U_T) for 5 cycles. 70% U_T (30% dip in U_T) for 25 cycles. <5% U_T (<95% dip in U_T) for 5 sec.	<5% U_T (>95% dip in U_T) for 0.5 cycle. 40% U_T (60% dip in U_T) for 5 cycles. 70% U_T (30% dip in U_T) for 25 cycles. <5% U_T (<95% dip in U_T) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of the EUT image intensifier requires continued operation during power mains interruptions, it is recommended that the EUT image intensifier be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms 150 kHz to 80 MHz	Portable and mobile RF communications equipment should be used no closer to any part of the EUT, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = [\frac{3.5}{V_1}]\sqrt{P}$ $d = [\frac{3.5}{V_1}]\sqrt{P}$ 80 MHz to 800 MHz $d = [\frac{7}{E_1}]\sqrt{P}$ 80 MHz to 800 MHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol:
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m 80 MHz to 2.5 GHz	

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the EUT is used exceeds the applicable RF compliance level above, the EUT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the EUT.

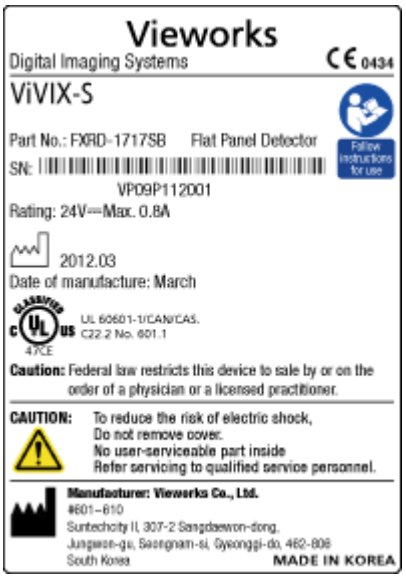
[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V_1] V/m.

Label and Symbols

FXRD-1717SA

Vieworks
Digital Imaging Systems
CE 0434
ViVIX-S
Part No.: FXRD-1717SA Flat Panel Detector
SN:
VP09P112001
Rating: 24V⎓Max. 0.8A
2012.03
Date of manufacture: March
UL 60601-1/CAN/CAS. C22.2 No. 601.1
47CE
Caution: Federal law restricts this device to sale by or on the order of a physician or a licensed practitioner.
CAUTION: To reduce the risk of electric shock, Do not remove cover. No user-serviceable part inside Refer servicing to qualified service personnel.
Manufacturer: Vieworks Co., Ltd.
#601-610
Suntechcity II, 307-2 Sangdaewon-dong,
Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-806
South Korea
MADE IN KOREA

FXRD-1717SB


Vieworks
Digital Imaging Systems
CE 0434
ViVIX-S
Part No.: FXRD-1717SB Flat Panel Detector
SN:
VP09P112001
Rating: 24V⎓Max. 0.8A
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#601-610
Suntechcity II, 307-2 Sangdaewon-dong,
Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-806
South Korea
MADE IN KOREA

FXRD-1417SA

Vieworks
Digital Imaging Systems
CE 0434
ViVIX-S
Part No.: FXRD-1417SA Flat Panel Detector
SN:
VP09P112001
Rating: 24V⎓Max. 0.5A
2012.03
Date of manufacture: March
UL 60601-1/CAN/CAS. C22.2 No. 601.1
47CE
Caution: Federal law restricts this device to sale by or on the order of a physician or a licensed practitioner.
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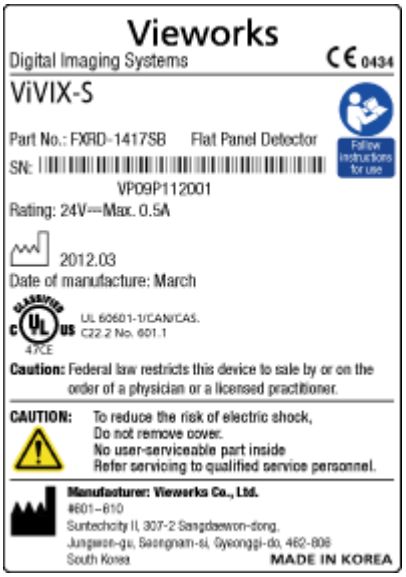
#601-610
Suntechcity II, 307-2 Sangdaewon-dong,
Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-806
South Korea
MADE IN KOREA

FXRD-1417SB


Vieworks
Digital Imaging Systems
CE 0434
ViVIX-S
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SN:
VP09P112001
Rating: 24V⎓Max. 0.5A
2012.03
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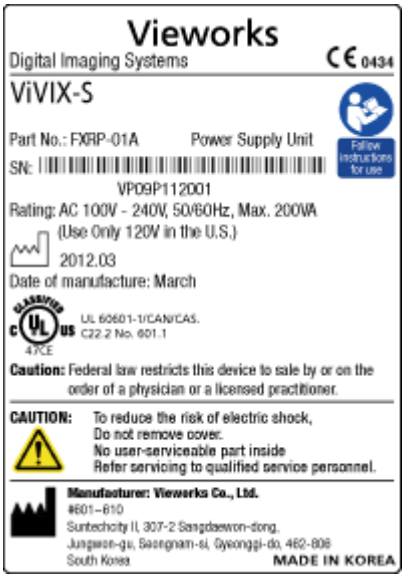
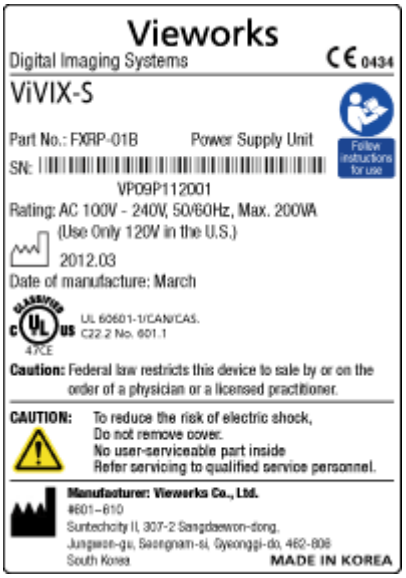
Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-806
South Korea
MADE IN KOREA

Power Supply Unit

FXRP-01A


Vieworks
Digital Imaging Systems
CE 0434
ViVIX-S
Part No.: FXRP-01A Power Supply Unit
SN:
VP09P112001
Rating: AC 100V - 240V, 50/60Hz, Max. 200VA
(Use Only 120V in the U.S.)
2012.03
Date of manufacture: March
UL 60601-1/CAN/CAS.
C22.2 No. 601.1
Caution: Federal law restricts this device to sale by or on the order of a physician or a licensed practitioner.
CAUTION: To reduce the risk of electric shock,
Do not remove cover.
No user-serviceable part inside
Refer servicing to qualified service personnel.
Manufacturer: Vieworks Co., Ltd.
#601-610
Suntechcity II, 307-2 Sangdaewon-dong,
Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-806
South Korea
MADE IN KOREA

FXRP-01B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CE 0434
ViVIX-S
Part No.: FXRP-01B Power Supply Unit
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Rating: AC 100V - 240V, 50/60Hz, Max. 200VA
(Use Only 120V in the U.S.)
2012.03
Date of manufacture: March
UL 60601-1/CAN/CAS.
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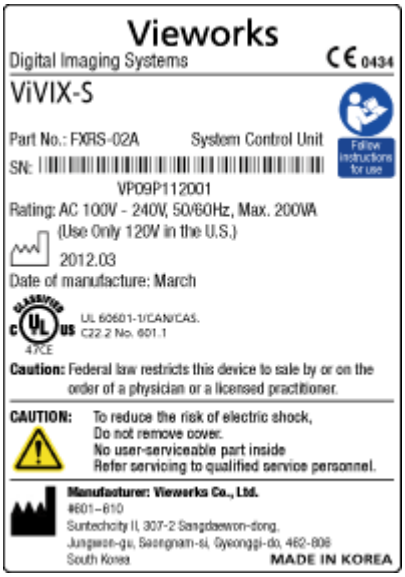
Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-806
South Korea
MADE IN KOREA

System Control Unit

FXRS-02A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Digital Imaging Systems
CE 0434
ViVIX-S
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VP09P112001
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C22.2 No. 601.1
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South Korea
MADE IN KOREA

Symbols

Symbol	Description
	Direct Current
	Alternating Current
	Protective Earth (Ground)
	Equipotentiality
	Power Off
	Attention, consult accompanying documents
	Power On
	Medical Equipment With Respect to electric shock, fire, and mechanical hazards only In accordance with UL60601-1 and CAN/CSA C22.2 No. 601.1.
	This mark shows compliance of the equipment with Directive 93/42/EEC.
	Read and understand all instructions and warning labels in the product documentation before using the equipment. Keep manual for future reference.

1. Overview

ViVIX-S is digital X-ray flat panel detectors which have 43 ㎝ × 43 ㎝ or 35.8 ㎝ × 43 ㎝ imaging area. The device intercepts X-ray photons and then the scintillator emits visible spectrum photons that illuminate an array of photo detectors (a-SI) that create electrical signals. After the electrical signals are generated, it is converted to a digital value and processed to enhance the visibility of the viewed image. The resultant output signal can be transmitted to remote viewing sites.

1.1 Features

- Compatible with not only new X-ray generators based on DR interface but also conventional X-ray generators
- Designed with simple wiring and lightweight for portable applications
- Image digitization, image inversion, image processing, zooming, panning, window level adjustment, contrast adjustment, and various features enable the operator to see diagnostic details that is difficult to see by using conventional non-digital techniques.

1.2 Intended Use

ViVIX-S is indicated for digital imaging solution designed for providing general radiographic diagnosis of human anatomy. This device is intended to replace film or screen based radiographic systems in all general purpose diagnostic procedures. This device is not intended for mammography applications.

1.3 Standard Configuration

1.3.1 Configuring with FXRD-1717SA (B)

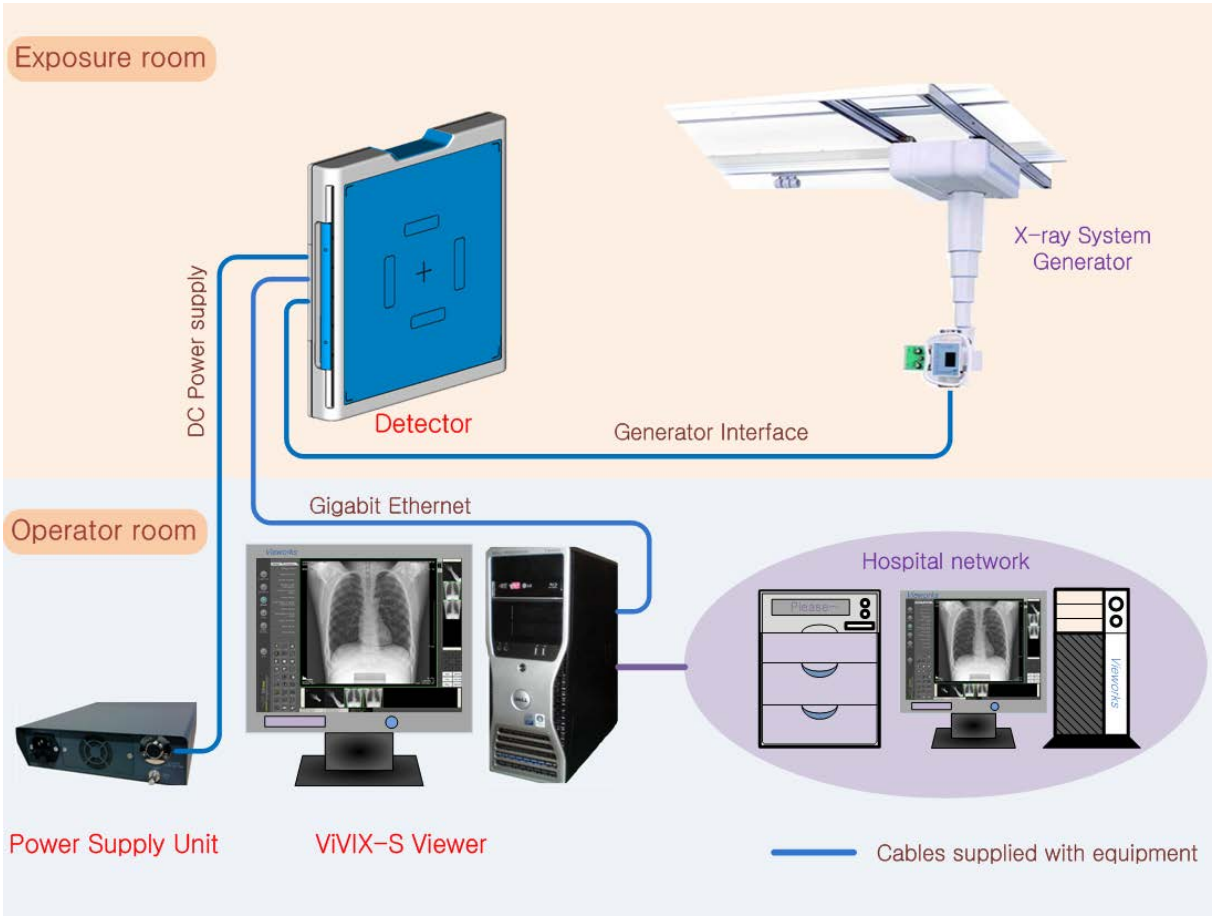


Figure 1.1 ViVIX-S System Configuration [FXRD-1717SA (B)]

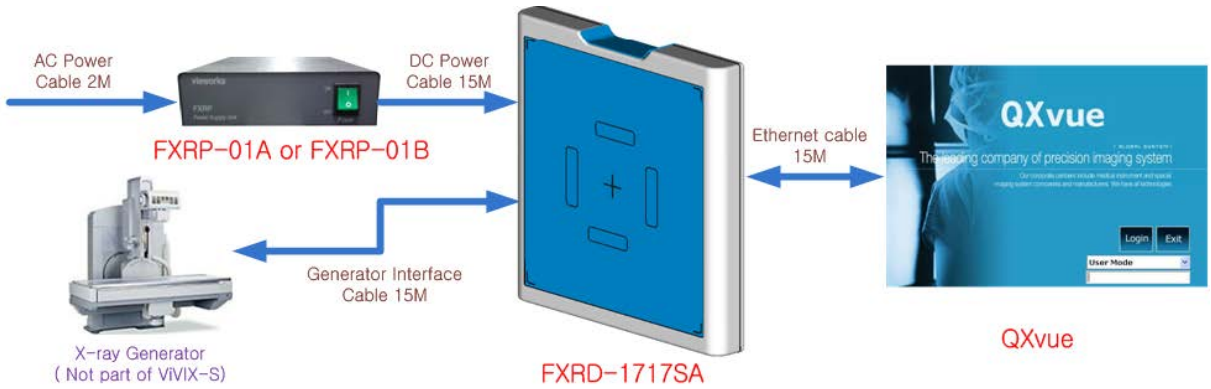


Figure 1.2 ViVIX-S System Description

1.3.2 Configuring with FXRD-1417SA (B)

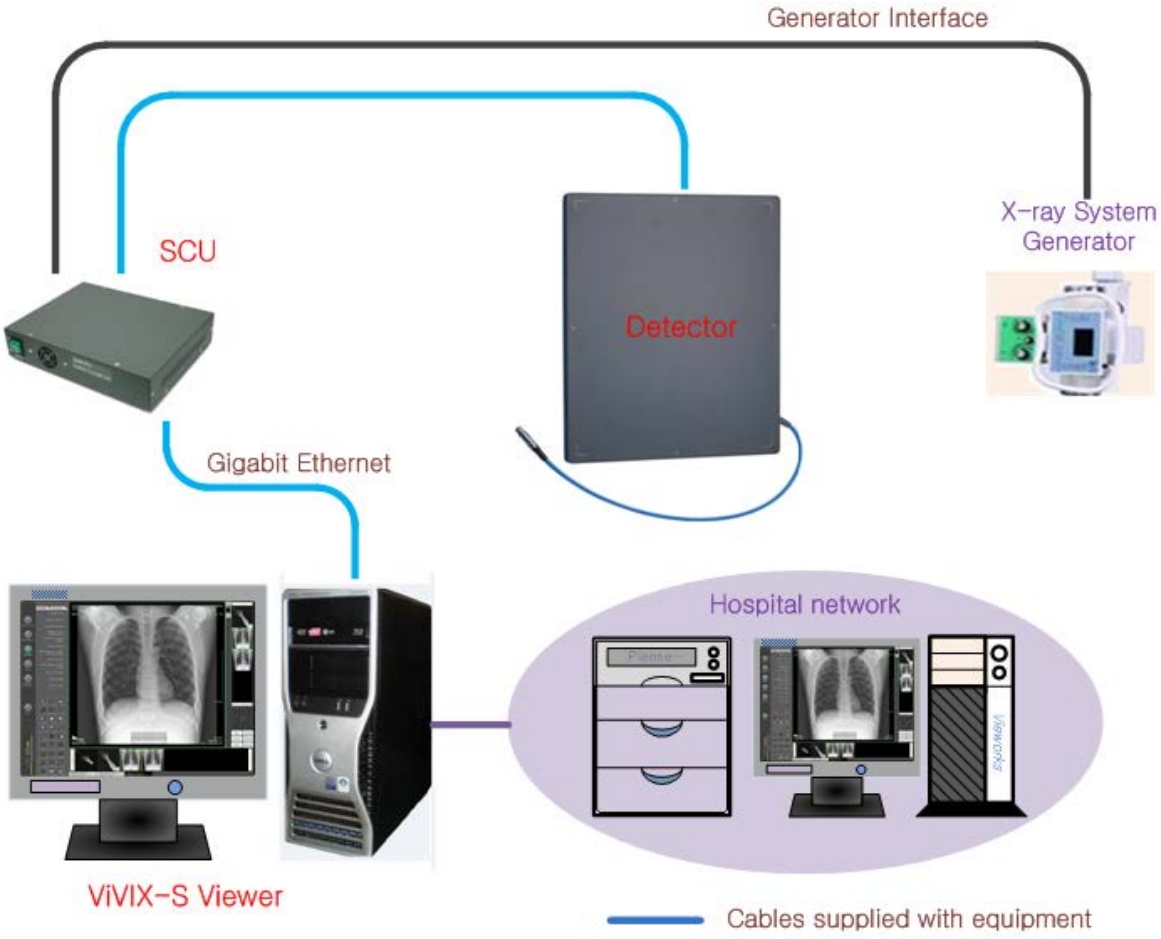


Figure 1.3 ViVIX-S System Configuration [FXRD-1417SA (B)]

1.4 Extended Configuration

QXvue allows you to configure X-ray imaging system with multiple ViVIX-S detectors according to the ChameleonSetup settings.

1.4.1 Configuring Multiple Detectors in a Single X-ray Imaging System

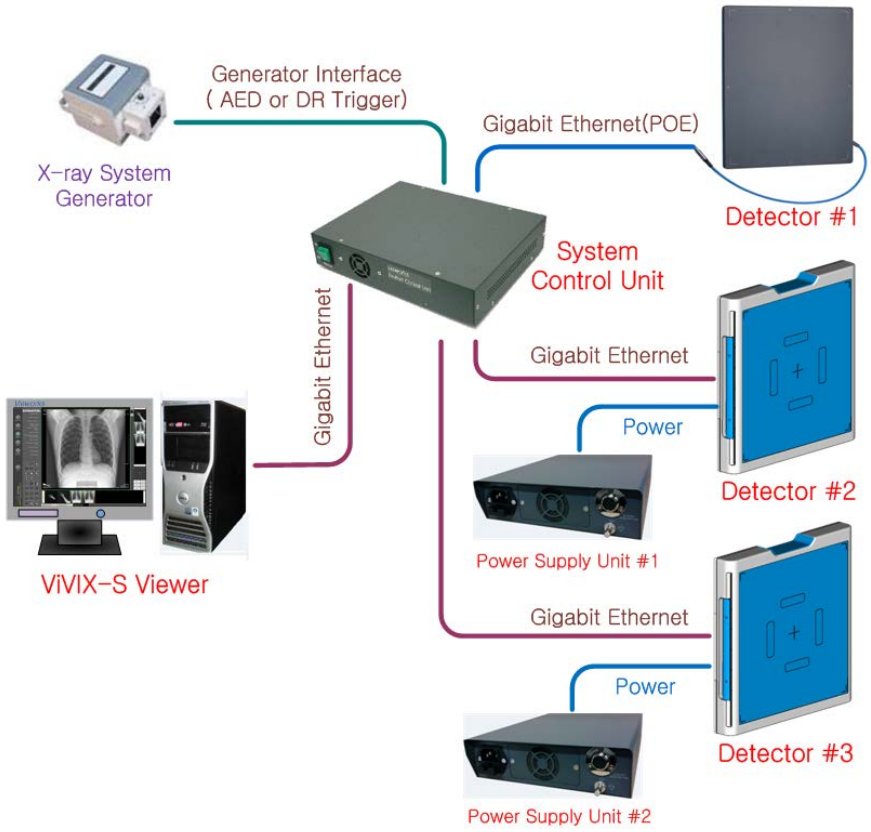


Figure 1.4 Multiple detectors [FXRD-1417SA(B)+FXRD-1717SA(B)] in a single X-ray Imaging System

- Each of detector's IP should be set in different address.
  - Able to setup IP address in ChameleonSetup
  - If two detectors have identical IP address as 169.254.1.10, change the IP on the detector firstly discovered in ChameleonSetup to 169.254.1.9 and then turn the power off and turn it on again.
- If you select a detector to use in Viewer while using DR (Line) Trigger Mode, the detector will be automatically controlled in System Control Unit (SCU).
- If you configure two or more detectors to use AED Mode in the same space, all detectors may react to X-ray exposure and send images to the viewer. Make sure to select the detector to use in the viewer.

1.4.2 Configuring Multiple Detectors in Multiple X-ray Imaging Systems

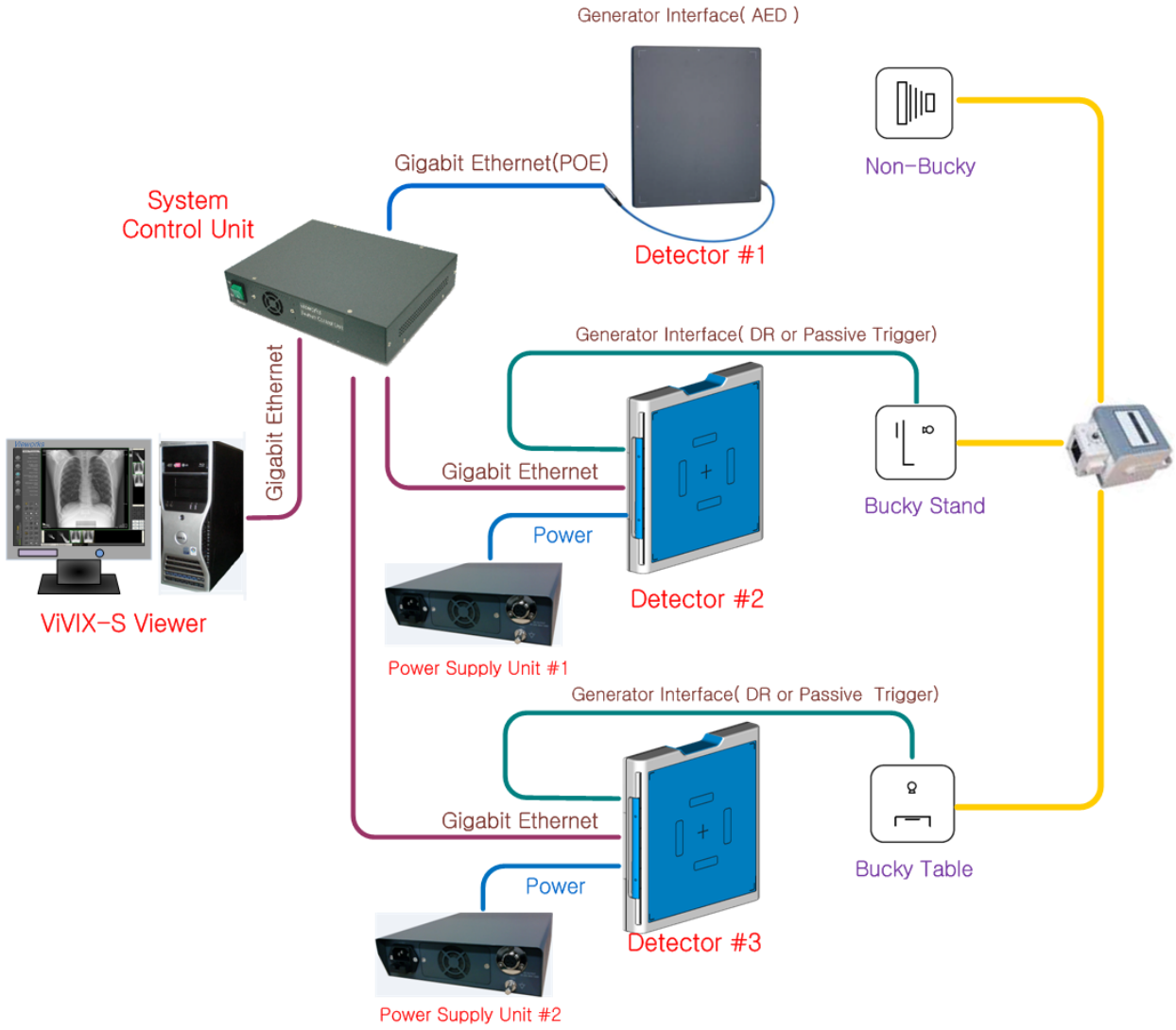


Figure 1.5 Multiple detectors [FXRD-1417SA(B)+FXRD1717SA(B)] in multiple X-ray imaging systems

- Each of detector's IP should be set in different address.
  - Able to setup IP address in ChameleonSetup
  - If two detectors have identical IP address as 169.254.1.10, change the IP on the detector firstly discovered in ChameleonSetup to 169.254.1.9 and then turn the power off and turn it on again.
- If you configure two or more detectors to use AED Mode in the same space, all detectors may react to X-ray exposure and send images to the viewer. Make sure to select the detector to use in the viewer.
- Detector #1(FXRD-1417SA/B) does not support Passive Trigger Mode.

1.4.3 Configuring Multiple Detectors in Multiple X-ray Imaging Systems using Gigabit Switch Hub

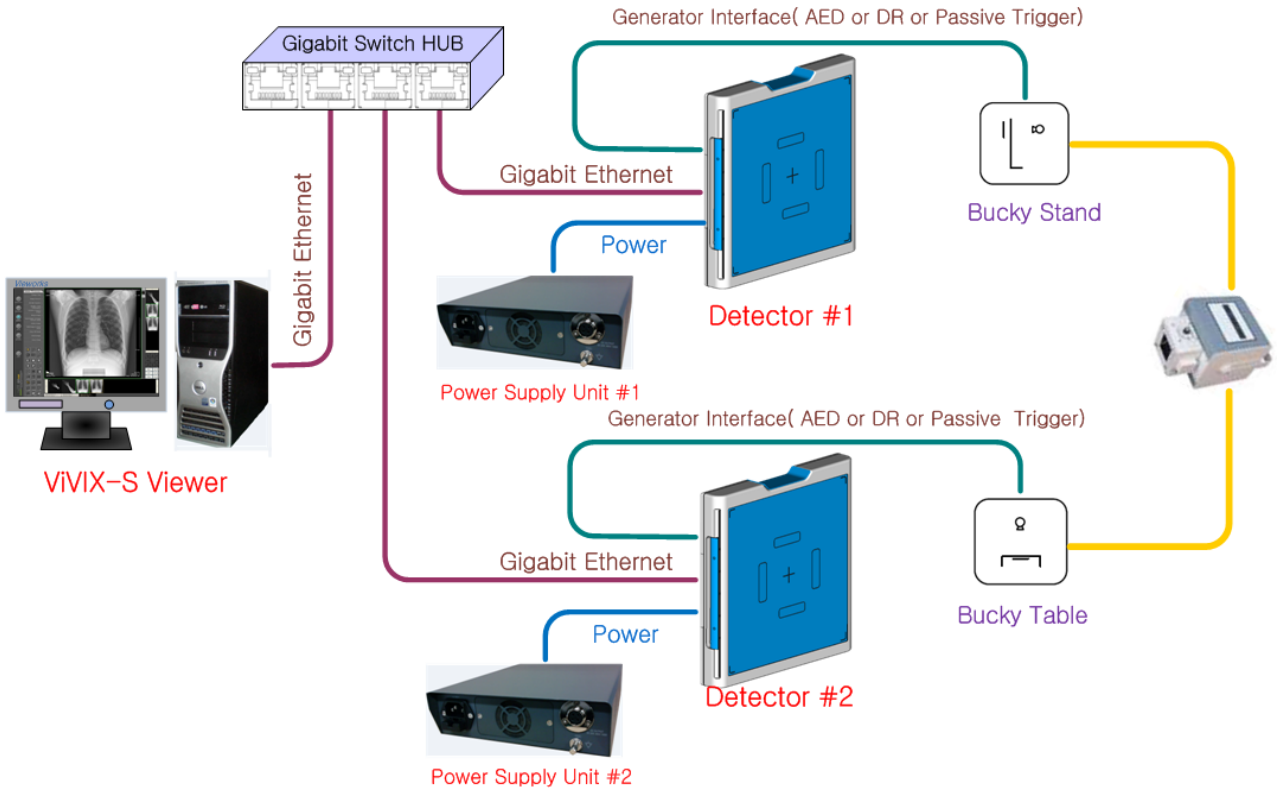


Figure 1.6 Multiple detectors [FXRD-1717SA(B)+FXRD1717SA(B)] in multiple X-ray imaging systems using Gigabit Switch Hub

	• Each of detector's IP should be set in different address. ▫ Able to setup IP address in ChameleonSetup ▫ If two detectors have identical IP address as 169.254.1.10, change the IP on the detector firstly discovered in ChameleonSetup to 169.254.1.9 and then turn the power off and turn it on again. • If you configure two or more detectors to use AED Mode in the same space, all detectors may react to X-ray exposure and send images to the viewer. Make sure to select the detector to use in the viewer. • You must use the Switch Hun that supports Gigabit specifications.

2. Product Description

ViVIX-S system consists of detector, power supply unit (PSU) or system control unit (SCU), software and its accessories.

2.1 Product Components

Part Name		Remarks
Detector	FXRD-1717SA, FXRD-1417SA	Scintillator: CsI (Cesium Iodide)
	FXRD-1717SB, FXRD-1417SB	Scintillator: Gadox (Gadolinium Oxysulfide)
Power Supply Unit (PSU)	FXRP-01A(01B)	Supported Detectors: FXRD-1717SA, FXRD-1717SB
System Control Unit (SCU)	FXRS-02A	Supported Detectors: FXRD-1417SA, FXRD-1417SB
Viewer (Software)	QXvue	Supported in All Detectors
Generator Interface Cable (15M)		Supported in All Detectors
Direct LAN Cable 15M (1000BASE-TX, 15M)		Supported in All Detectors
DC Power Cable (15M)		Supported Detectors: FXRD-1717SA, FXRD-1717SB
Ether Con Cable (3M, 12M - Optional)		Supported Detectors: FXRD-1417SA, FXRD-1417SB

Table 2.1 Product Components

CAUTION	The use of accessories and cables other than those specified, with the exception of ViVIX-S accessories and cables sold by Vieworks Co., LTD. as replacement parts for internal components, may result in increased emissions or decreased immunity of the equipment. Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC standards. All combinations of equipment must be in compliance with IEC 60601-1-1 system requirements. Any person who connects additional equipment to the signal input or signal output ports configures a medical system, and is therefore responsible for ensuring that the system complies with the requirements of the system standard IEC 60601-1. If you have any questions, consult Vieworks technical support representative.

Workstation (Recommended but NOT included)

- Operating System: Windows XP professional SP2 or Windows 7 (32 bit)
- CPU: Pentium 4, 3.0 GHz or above
- Memory: 4 GB or higher
- Hard Disk: 120 GB or higher
  The hard disk must be divided into C and D drive or partitioned.
- Ethernet (NIC): Gigabit (2EA) - 1Gbps or faster
  Intel Gigabit CT is recommended for Network Interface.
  This is not dedicated to DICOM.
  Receive Packet: 1,024 or higher
- Monitor: 1280 x 1024 or higher (Recommended: 1600 × 1200, Color)
- CD-Rom: CD or DVD R/W

Grid (Recommended but NOT included)

Item	Description
SID	100 /130/150/180 cm
Ratio	8 : 1
Frequency	215 Line/inch
INTER SPACER	AL

Table 2.2 Grid Specifications

2.2 Detector

2.2.1 Detector Specifications

Item	Description	
Model	FXRD-1717SA(B)	FXRD-1417SA(B)
Purpose	General radiography	
Image Matrix Size	3072 × 3072 pixels	2560 × 3072 pixels
Pixel Pitch	140 ㎛	
Effective Imaging Area (H × V) FullView Dynamic Preview 11 × 11 Dynamic Preview 8 × 8	 430 ㎜ × 430 ㎜ 286 ㎜ × 286 ㎜ (4.2 fps) 215 ㎜ × 215 ㎜ (5.6 fps)	358 ㎜ × 430 ㎜
Grayscale	14 bit, 16,384 grayscale	
Scintillator	CsI (Cesium Iodide) or Gadox (Gadolinium Oxysulfide)	
Image Acquisition and Transfer Time	3 s	
Spatial Resolution	Min. 3.5 line pair/㎜	
Power Supply	DC +24 V, 0.8 A	DC +24 V, 0.5 A
Power Consumption	Max. 20 W	Max. 12 W
Network Interface	16 bit Digital Output Ethernet (1000BASE-T)	
Imaging Plate	Carbon Fiber Plate	
Cooling	Air cooling	
Dimensions (㎜)	470 (H) × 470 (V) × 35 (D) (without Case) 520 (H) × 520 (V) × 75 (D) (with Case)	444 (H) × 460 (V) × 15 (D)
Weight	11 kg (without Case) 18 kg (with Case)	SA: 2.9 kg (without grip) SB: 2.7 kg (without grip)
Environmental Requirements		
Operation	Temperature: +10 ~ +35℃ Humidity: 30 ~ 85% (Non-Condensing) Atmospheric pressure: 70 ~ 106 ㎪ Altitude: Maximum 2000 meter	
Storage and transportation	Temperature: -15 ~ +55℃ Humidity: 10 ~ 90% (Non-Condensing) Atmospheric pressure: 50 ~ 106 ㎪ Altitude: Maximum 2000 meter	

Table 2.3 Detector Specifications

2.2.2 Detector Components

2.2.2.1 FXRD-1717SA (B)

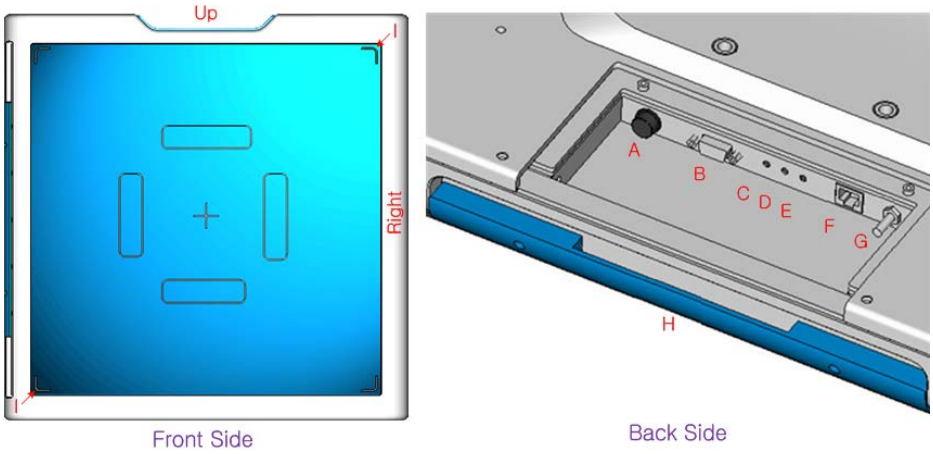


Figure 2.1 Detector Components [FXRD-1717SA (B)]

No.	Name	Description
A	DC Power Connector	DC +24V Input
B	Generator Interface Connector	D-SUB 9 Pin, Female
C	Status indicators [POWER]	Indicates power on/off status. Green color: Power ON
D	Status indicators [STATUS]	Indicates CPU Status of the Detector. Green color: Ready to work(Normal)
E	Status indicators [EXP_OK]	Indicates Exposure (X-ray on/off) status During exposure, LED lit green
F	Gigabit Ethernet Port	Transmission / Communication between FPD and PC
G	P.E.	Earth Terminal
H	X-ray Grid Cabinet	Grid cabinet for holding X-ray grids
I	Effective imaging area border	Indicates the effective imaging area.

Table 2.4 Detector Components [FXRD-1717SA (B)]

2.2.2.2 FXRD-1417SA (B)

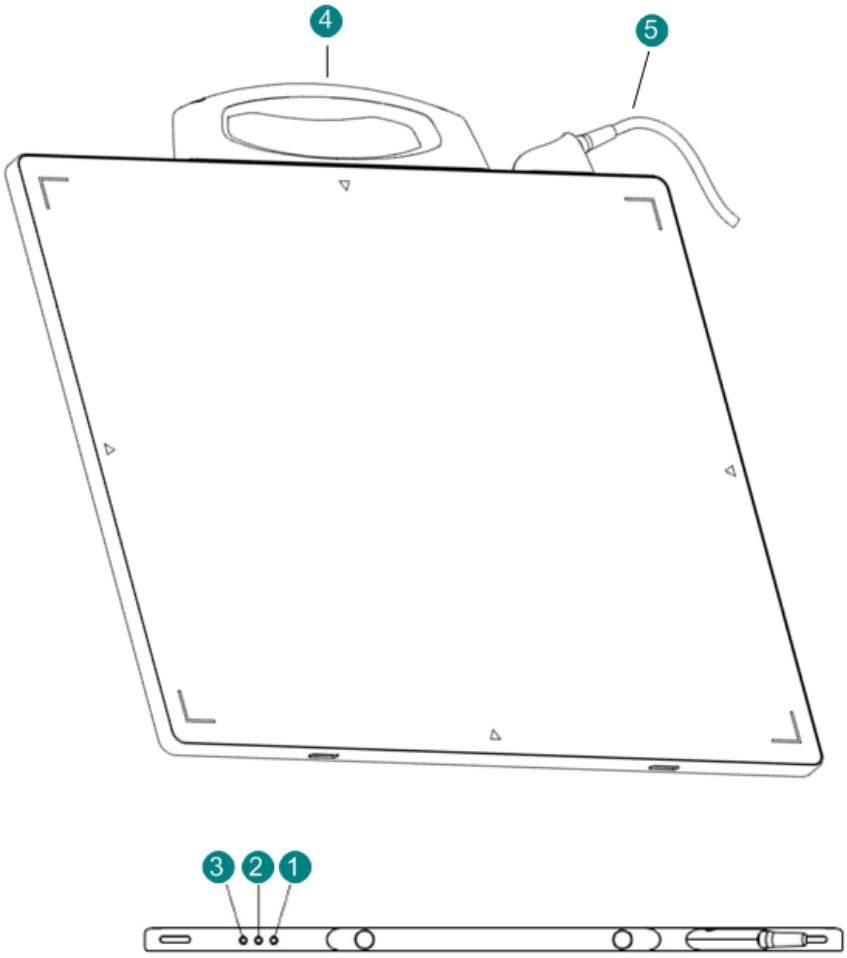


Figure 2.2 Detector Components [FXRD-1417SA (B)]

No.	Name	Description	
1	Status Indicator	LED1:	Indicates power on/off status. Green: Power On
2	Status Indicator	LED 2:	Indicates communication status. Green: Link On
3	Status Indicator	LED3:	Indicates transmission status. Green: Transmission
4	Grip	Hold this grip when carrying the detector.	
5	Detector Cable	Connect this cable to the System Control Unit (SCU) to communicate and to supply the electric power.	

Table 2.5 Detector Components Description [FXRD-1417SA (B)]

2.2.3 Detector Dimension

2.2.3.1 FXRD-1717SA (B)

FXRD-1717SA (B) - without Case, unit: mm

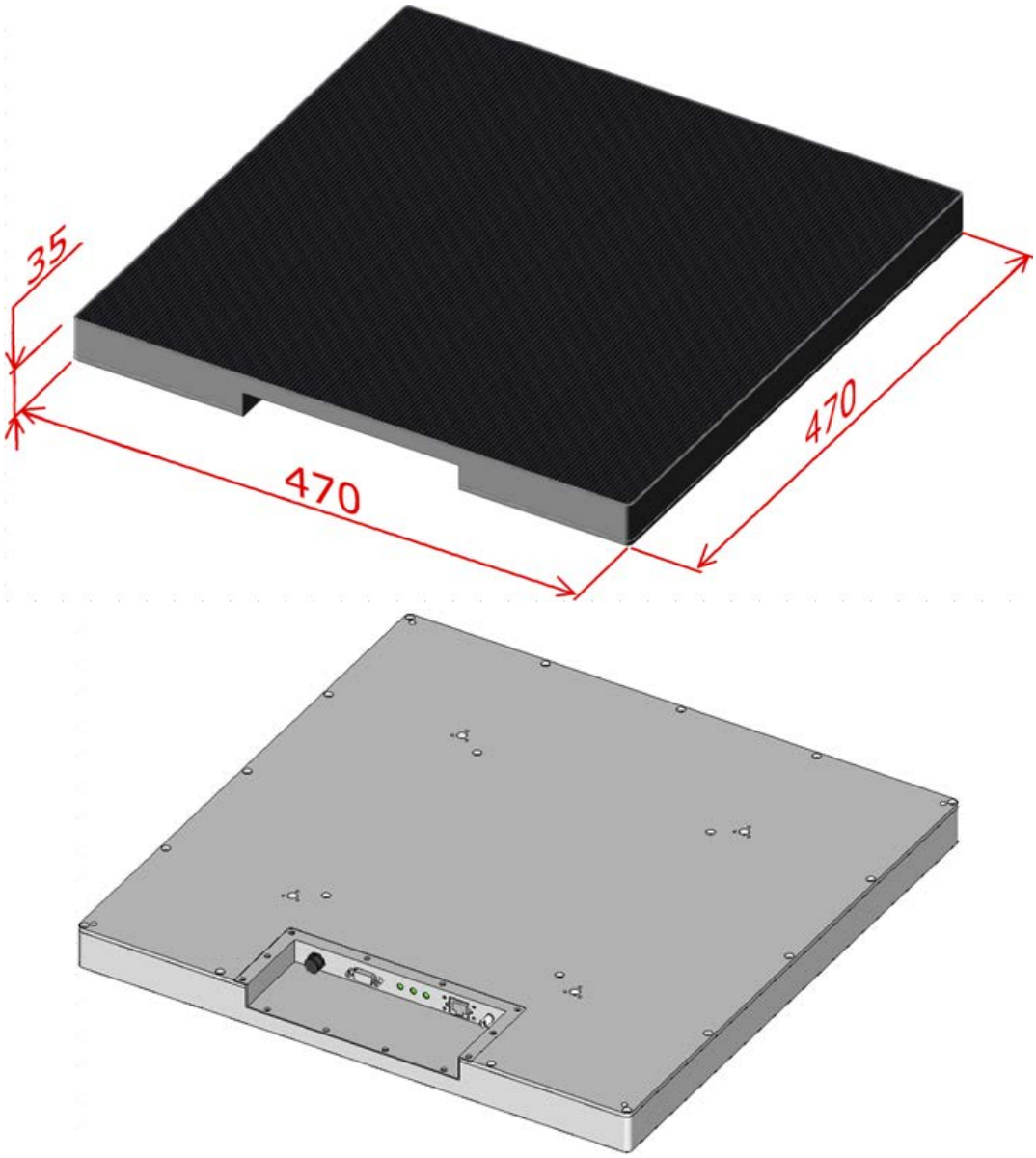
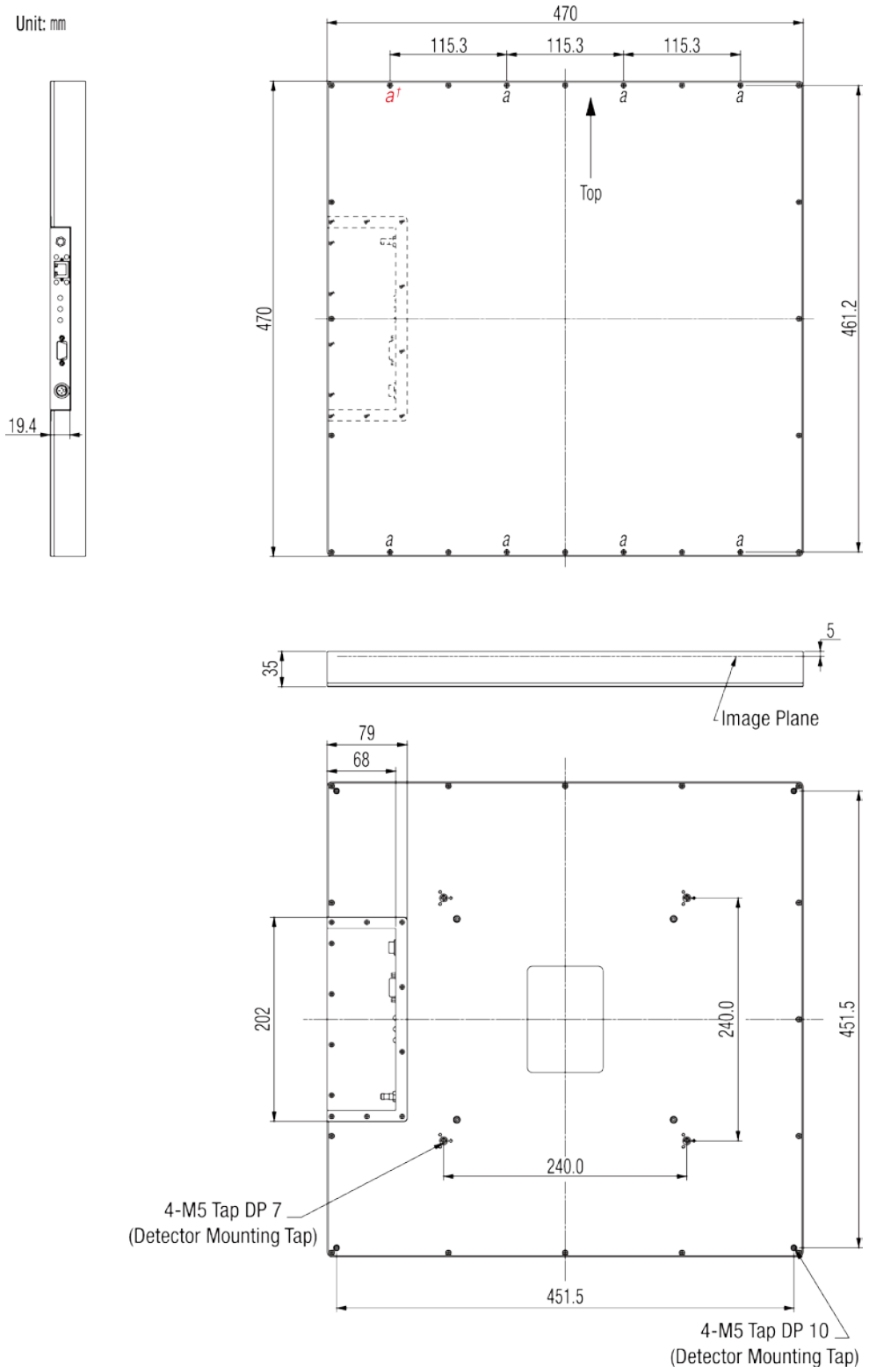


Figure 2.3 Detector External Appearance [FXRD-1717SA (B) – without Case]



- To install the grid rail, unscrew a ×8 and use M2.6 Tap holes to fix grid rails.
- † a: M2.6 Flat Head Screw

Figure 2.4 Detector Dimension [FXRD-1717SA (B) – without Case]

FXRD-1717SA (B) - with Case, unit: mm

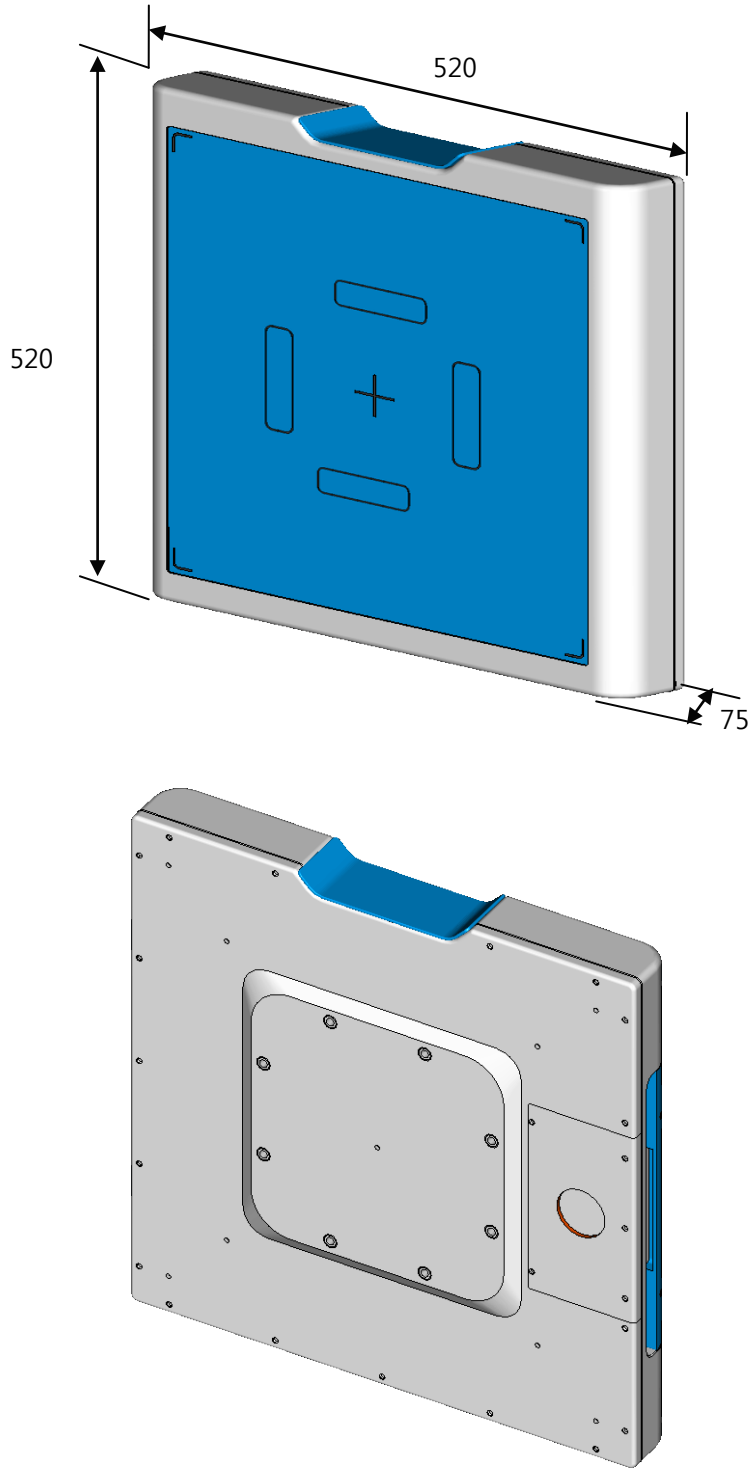


Figure 2.5 Detector External Appearance [FXRD-1717SA (B) – with Case]

2.2.3.2 FXRD-1417SA (B)

FXRD-1417SA (B) - without Case, unit: ㎜

	The detachable grip allows you to use the detector for immediate availability and various applications.

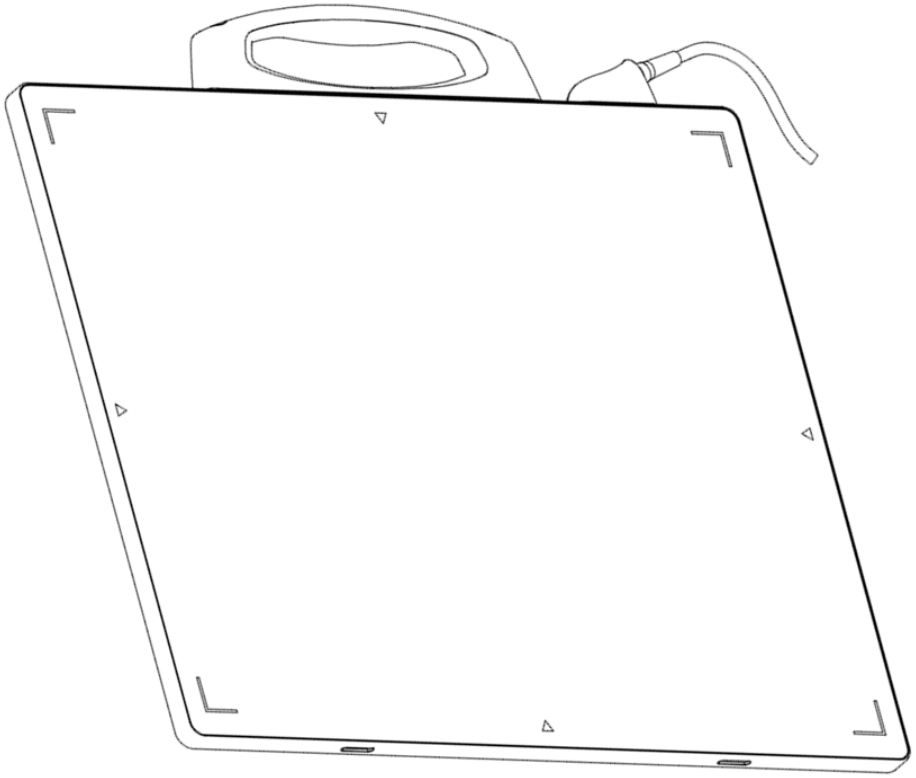


Figure 2.6 Detector External Appearance [FXRD-1417SA (B) – without Case]

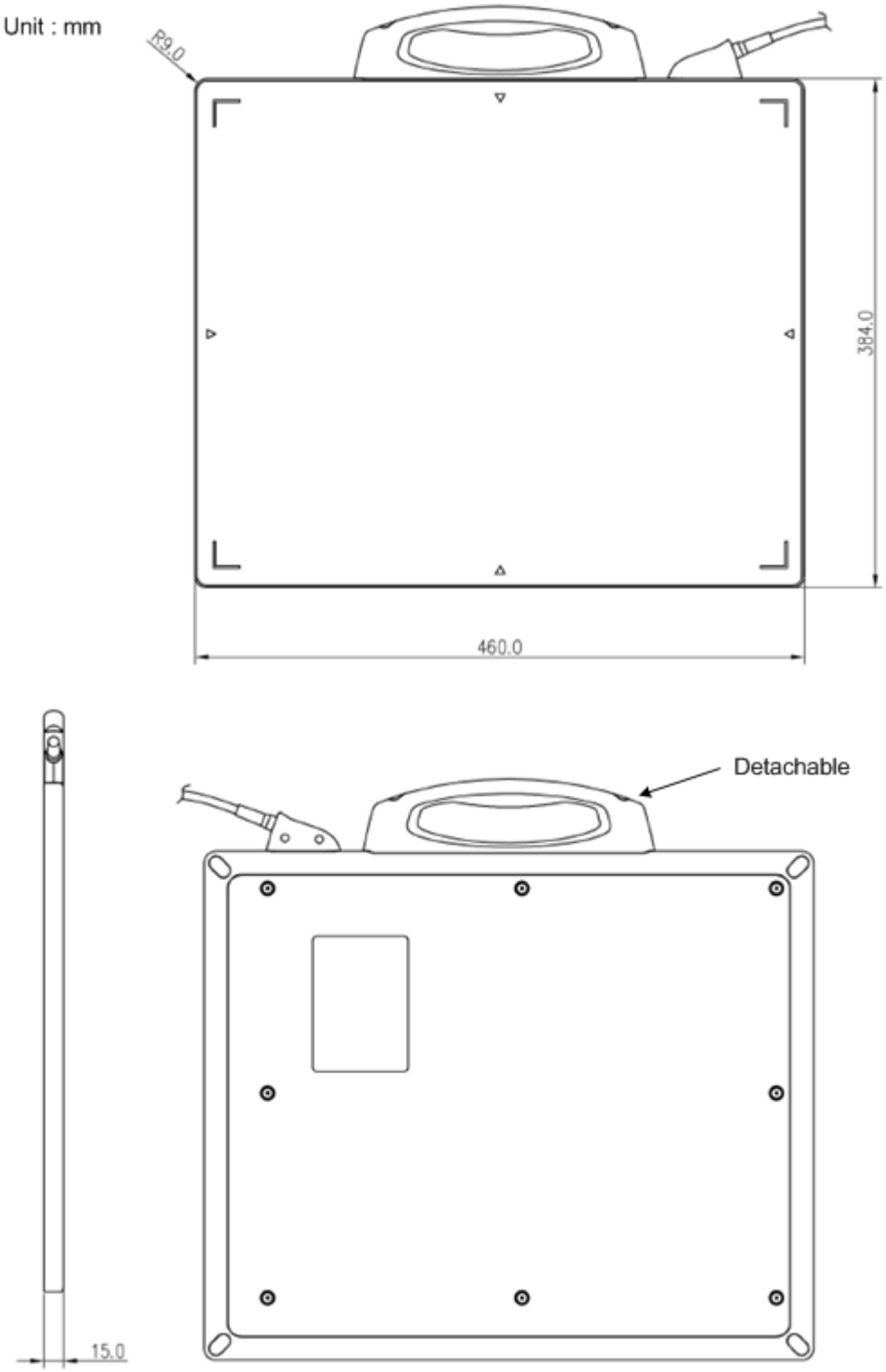


Figure 2.7 Detector Dimension [FXRD-1417SA (B) – without Case]

FXRD-1417SA (B) - with Case, unit: mm

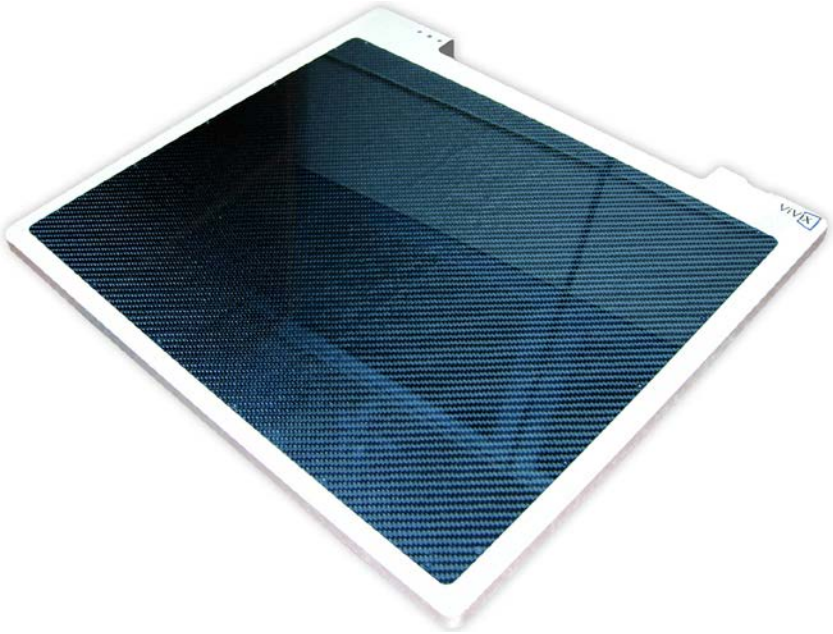


Figure 2.8 Detector External Appearance [FXRD-1417SA (B) – with Case]

2.3 Power Supply and System Control Unit

2.3.1 Specifications

Item	Description	
	Power Supply Unit	**System Control Unit**
Model	FXRP-01A, FXRP-01B	FXRS-02A
Power Supply	Input: AC100 to 240V, 50/60 ㎐ Output: DC +24V 3.3A, 80W	Input: AC100 to 240V, 50/60 ㎐ Output: DC +24V 4A, 80W
Dimensions (㎜)	190 (W) × 235 (H) × 55 (D)	270 (W) × 210 (H) × 55 (D)
Weight	2 ㎏	2.2 ㎏
Environmental Requirements		
Operation	Temperature: +10 ~ +35℃ Humidity: 30 ~ 85% (Non-Condensing) Atmospheric pressure: 70 ~ 106 ㎪ Altitude: Maximum 2000 meter	
Storage and transportation	Temperature: -15 ~ +55℃ Humidity: 10 ~ 90% (Non-Condensing) Atmospheric pressure: 50 ~ 106 ㎪ Altitude: Maximum 2000 meter	

Table 2.6 Power Supply and System Control Unit Specifications

2.3.2 Power Supply and System Control Unit Components

2.3.2.1 Power Supply Unit Dimensions and Components

FXRP-01A (01B)

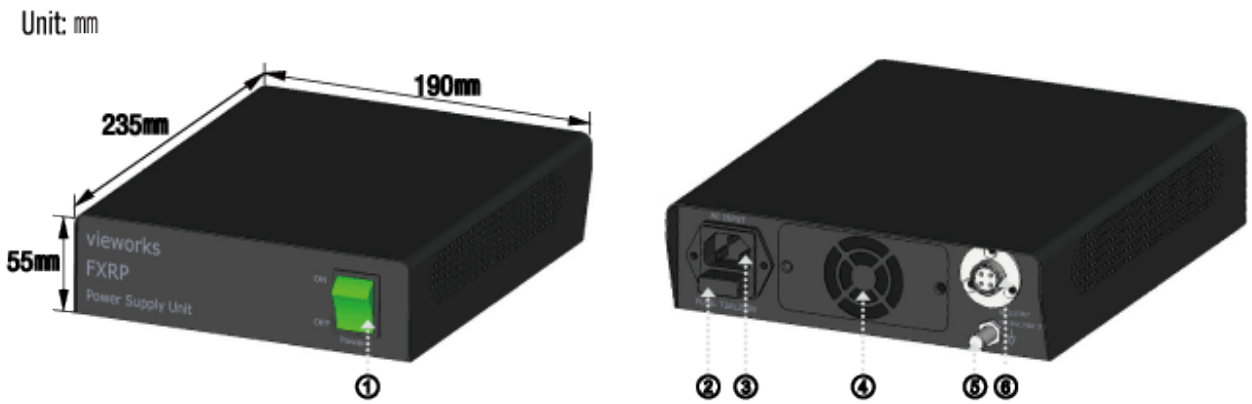


Figure 2.9 Power Supply Unit

No.	Name	Description
1	Power Switch	Main Power Switch for ViVIX-S System Green light: Power On
2	Fuse Case	T2AL250V Fuse (2 EA)
3	AC Power Inlet.	Input, 100~240V, 50/60 ㎐
4	FAN	Cooling the SMPS inside of the PSU
5	P.E	Earth Terminal
6	DC Power Output Connector	DC +24V Output

Table 2.7 Power Supply Unit Components

P.E (Potential Equalization) of PSU is used to keep equipotential between PSU and an equipment to be used with ViVIX-S. To connect to P.E of equipment, use a ground cable.

2.3.2.2 System Control Unit Dimensions and Components

FXRS-02A

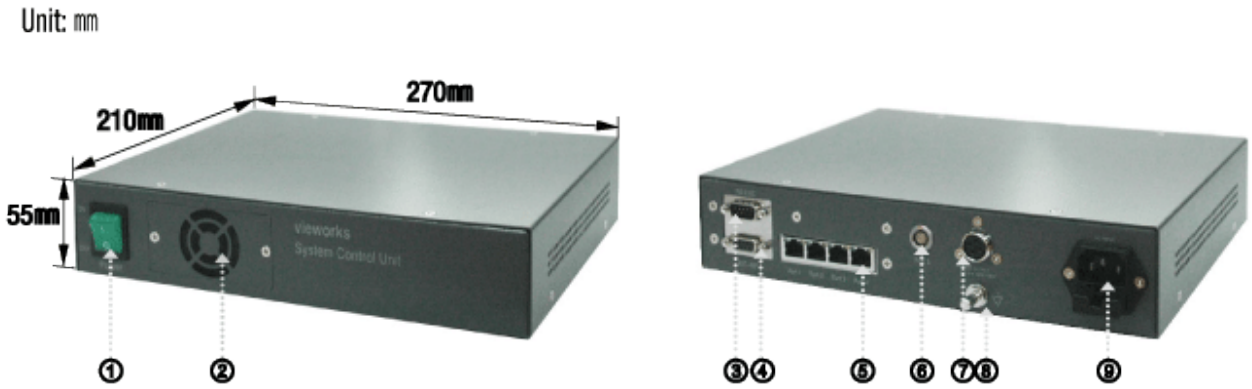


Figure 2.10 System Control Unit

No.	Name	Description
1	Power Switch	• Turns on or off the SCU. Green Light: Power On
2	Fan	• Expels heated air inside of the SCU.
3	RS-232C Port	• Provides serial communication between the workstation and SCU using RS-232. • Debug port
4	EXT_INF Port	• Provides connection to the X-ray generator.
5	Ethernet Port 2 ~ 5	• Provides Gigabit Ethernet (1000Base – T) communication between the workstation and SCU.
6	Power over Ethernet Port 1	• Connection interface to communicate with the detector and to supply power to the detector (Only for FXRD-1417).
7	Power Supply	• Connection interface to supply power to a non-portable detector. • Max. DC +24V/4A
8	P.E	• Earth Terminal
9	AC Input	• Connect the power cable to the power socket to supply power to SCU. • 100 ~ 240V, 50/60 Hz, T2AL250V Fuse (2 EA)

Table 2.8 System Control Unit Components

P.E (Potential Equalization) of SCU is used to keep equipotential between SCU and an equipment to be used with ViVIX-S. To connect to P.E of equipment, use a ground cable.

2.3.3 Fuse

Two fuses are installed inside of PSU and SCU to prevent electrical accidents due to an error such as overcurrent occurred in the AC Input. Stop immediately using PSU and SCU when fuses break.

Item	Description
Model	Littlefuse® 218002 (2 EA)
Type	Time Lag Cartridge Fuse
Amp Rating	2 A
Voltage Rating	250 V

Replacing Fuses

WARNING	• Turn off PSU or SCU and its peripheral equipment, and pull the plug out of the power socket before replacing fuses. • When fuses break, resolve the cause of overcurrent first, and then replace the fuses with extra fuses (optional items, one set of two) or equivalent rating fuses. • User must not contact a fuse holder with a patient and do not allow patient to touch the fuse holder.

1. Pull the fuse holder out from its receptacle under AC Input on the back panel of PSU or SCU.

2. Check the fuse(s) and replace it if necessary, using the fuse type and rating specified above.

3. Push the fuse holder back.

2.4 X-ray Generator Interface

2.4.1 X-ray Exposure Mode

Mode	Description
DR Trigger Mode	1 The detector receives EXP_REQ signal that X-ray generator is prepared to generate X-rays. 2 The detector prepares image acquiring and then responds EXP_OK signal to the X-ray generator. 3 The X-ray generator confirms EXP_OK signal and generates X-rays, then the detector performs image acquiring according to Image Acquisition Time and transmits the image data. • EXP_REQ (Generator → Detector), EXP_OK (Detector → Generator)
Passive Mode	• The X-ray generator generates X-rays after sending EXP_REQ signal. • The detector receives EXP_REQ signal that X-ray generator is prepared to generate X-rays, and then performs image acquiring according to Image Acquisition Time and transmits the image data. • EXP_REQ (Generator → Detector)
AED Mode	• The detector detects actual amount of X-rays without any connection to the X-ray generator, and then performs image acquiring according to Image Acquisition Time and transmits the image data. • No signal used (No need to connect Generator Interface Cable.)

Table 2.9 Exposure Mode

2.4.1.1 DR Trigger Mode

DR (Line) Trigger is the most common and recommended exposure mode. User can achieve the best quality images with DR Trigger Mode.

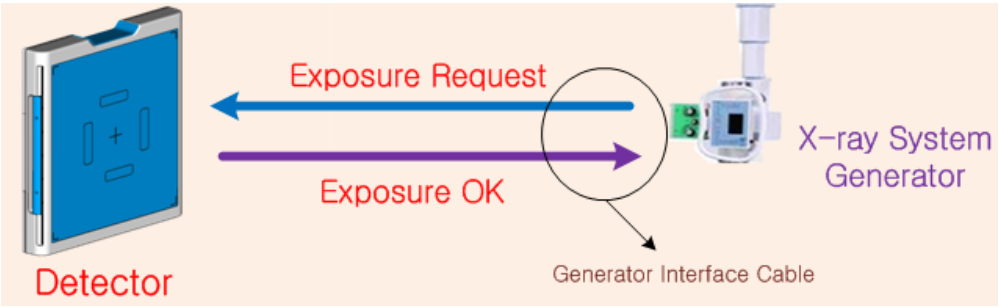


Figure 2.11 DR Trigger Mode Configuration

	It is recommended to use DR Trigger Mode for system stability and X-ray image quality.

2.4.1.2 Passive Trigger Mode

It needs only Exposure Request signal for taking X-ray picture.
(EXP_REQ, EXP_REQ_RET) or (EXP_REQ_TTL, EXP_REQ_TTL_TET)

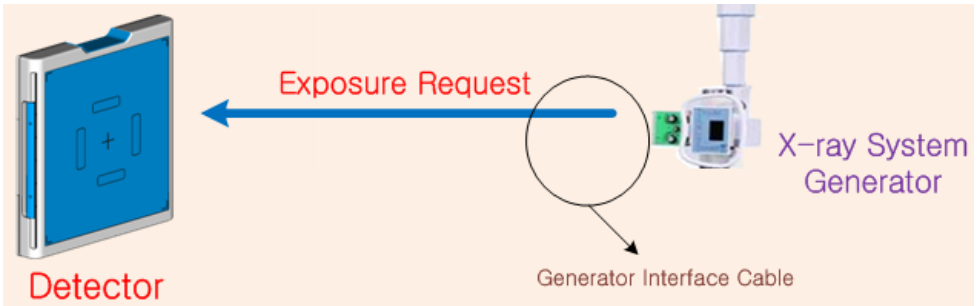


Figure 2.12 Passive Trigger Mode Configuration

	Passive Trigger Mode is supported only in FXRD-1717SA/B.

2.4.1.3 AED Mode

AED is available for acquiring images without any connection to X-ray generator. Generator interface cable is not required.

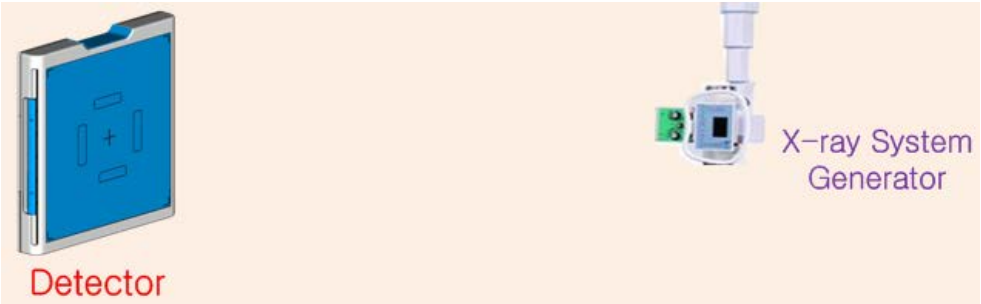


Figure 2.13 AED Configuration

CAUTION	• Make sure to follow operating environmental requirements (Temp: +10℃ ~ +35℃). • If you use AED Mode out of operating environmental requirements, unwanted image can be acquired without X-ray image acquiring. • Do not hit or drop the equipment. Unwanted images may be acquired in the AED Mode if it receives strong jolt. • If you use a Grid under general imaging condition (Dose) or image a thick object in the AED Mode, the efficiency of X-ray transformation may be reduced about 0% ~ 2% compared to the DR Trigger Mode according to the thickness of the target. • If you image a thick object in the AED Mode with low X-ray tube voltage, an image may not be acquired or horizontal line noise may occur. • When you set X-ray exposure area in the direction of the detector, the center of the detector should be included in the X-ray exposure area. Otherwise, you may not acquire an image.

	• AED Mode is recommended only if DR Trigger or Passive Trigger Mode cannot be configured. • AED performance is proportional to KV energy. Therefore, it is recommended to increase KV as much as possible and relatively decrease ㎃ and ㎳.

2.4.2 Timing of Signals (DR Trigger Mode)

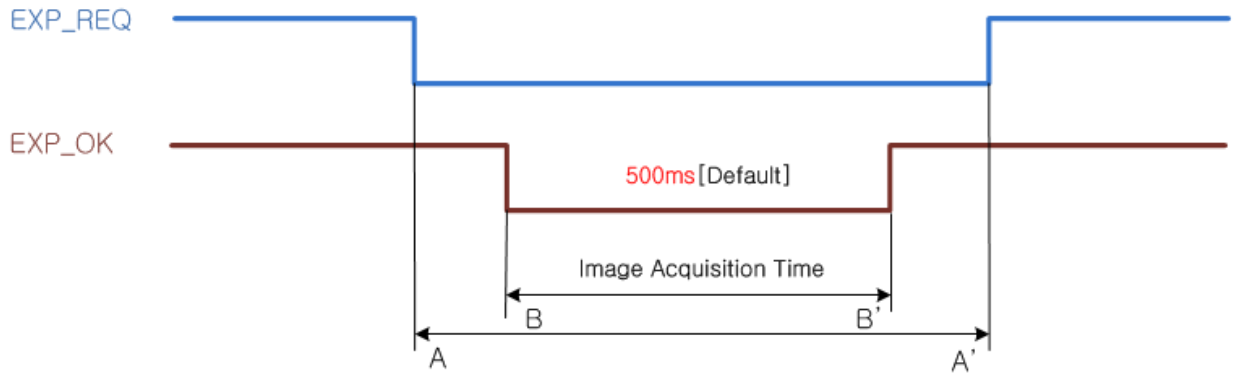


Figure 2.14 Timing of EXP signals

- Image Acquisition Time: X-ray generation period
  - Exposure request signal A (EXP_REQ) should be applied first, then exposure respond signal B (EXP_OK) or simultaneously.
  - Image Acquisition Time can be set from 40 ㎳ to 4,000 ㎳ with 1 ㎳ increment when default value is 500 ㎳.

CAUTION	• Do not expose X-rays greater than image acquisition time (default value: 500 ㎳). Otherwise, vertical lines noise may occur.

	• If you install a ViVIX-S detector where the doses of X-ray are more than 500 ㎳, **Exposure Section** should be set with 50 ㎳ longer than the maximum X-ray exposure time in ChameleonSetup.

2.4.3 EXT_INF Port Pin Assignment

EXT_INF port is D-SUB 9 pin female connector (detector side).

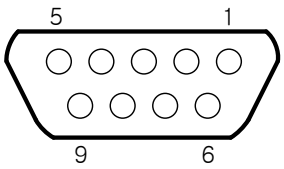


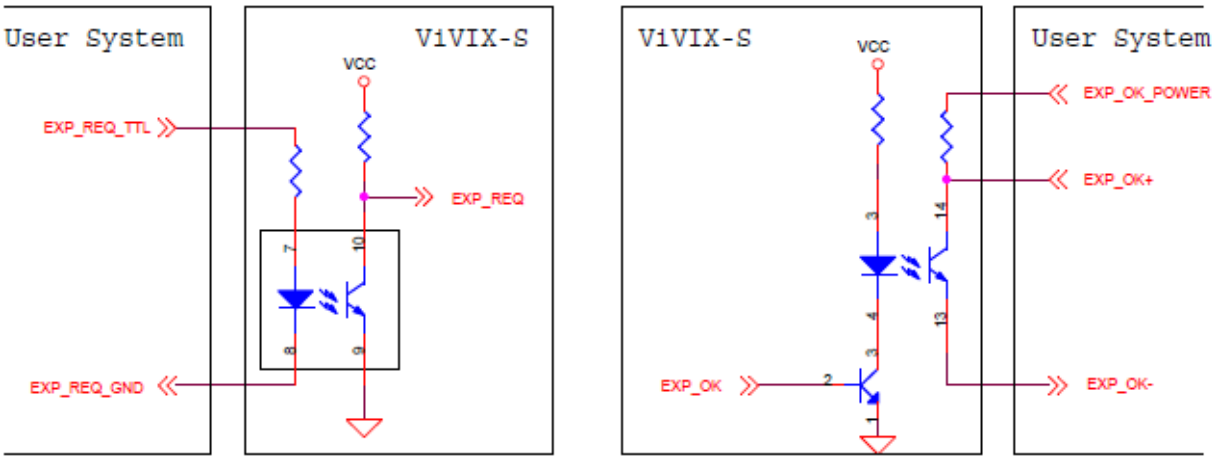
Figure 2.15 EXT_INF port pin assignments

No.	Signal Name	I/O	Description
1	EXP_REQ_TTL	Input	• Detector receives signal that X-ray generator is prepared to generate X-rays. • TTL (Voltage) Type – On: VCC, Off: GND
2	EXP_REQ+	Input	• Detector receives signal that X-ray generator is prepared to generate X-rays. • Contact Type – On: Closed, Off: Open • Current (5 ㎃ ~ 10 ㎃), Voltage (12 V ~ 24 V) • Same signal name with EXP_REQ
3	EXP_OK+	Output	• Detector responds to X-ray generator about X-ray generation. • The X-ray generator generates X-rays according to this signal and then the detector performs X-ray image acquiring. • Same signal name with EXP_OK
4	PRE_SW	-	• Do not connect. Reserved for testing.
5	EXP_OK_POWER	Input	• Power of TTL signal coming from X-ray generator
6	EXP_REQ_GND	Input	• Return signal from EXP_REQ_TTL • Same signal name with EXP_REQ_TTL_RET
7	EXP_REQ-	Input	• Return signal from EXP_REQ+. • Same signal name with EXP_REQ_RET
8	EXP_OK-	Output	• Return signal from EXP_OK+ • Same signal name with EXP_OK_RET
9	PRE_SW_RET	-	• Do not connect. Reserved for testing.

Table 2.10 EXT_INF port pin description

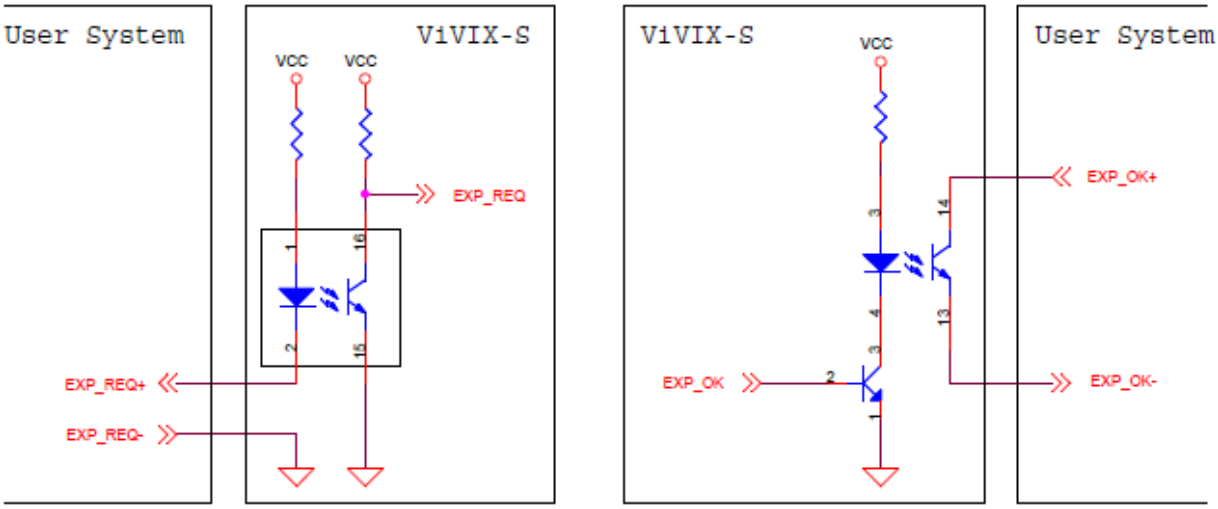
2.4.4 Input and Output Circuits

The following diagrams describe exposure request and exposure OK circuits.



<Request Input> **<Request Output>**

Figure 2.16 TTL Type Exposure Request Input and Output Circuit



<Request Input> **<Request Output>**

Figure 2.17 Contact Type Exposure Request Input and Output Circuit

The following diagram describes a sample interface between the detector and X-ray generator.

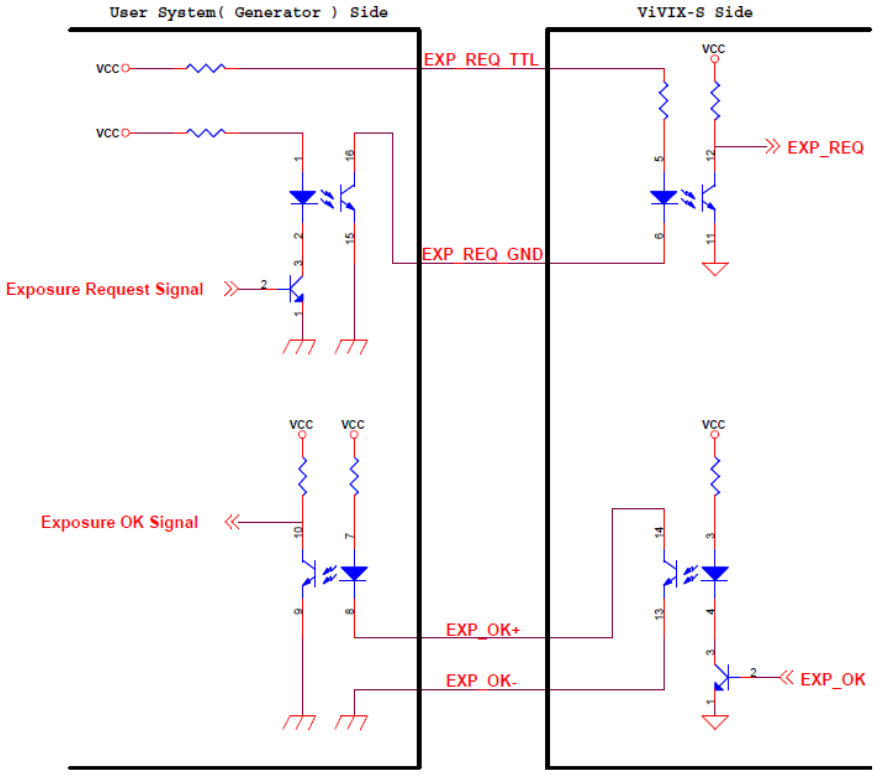


Figure 2.18 TTL Type Interface between the detector and X-ray generator

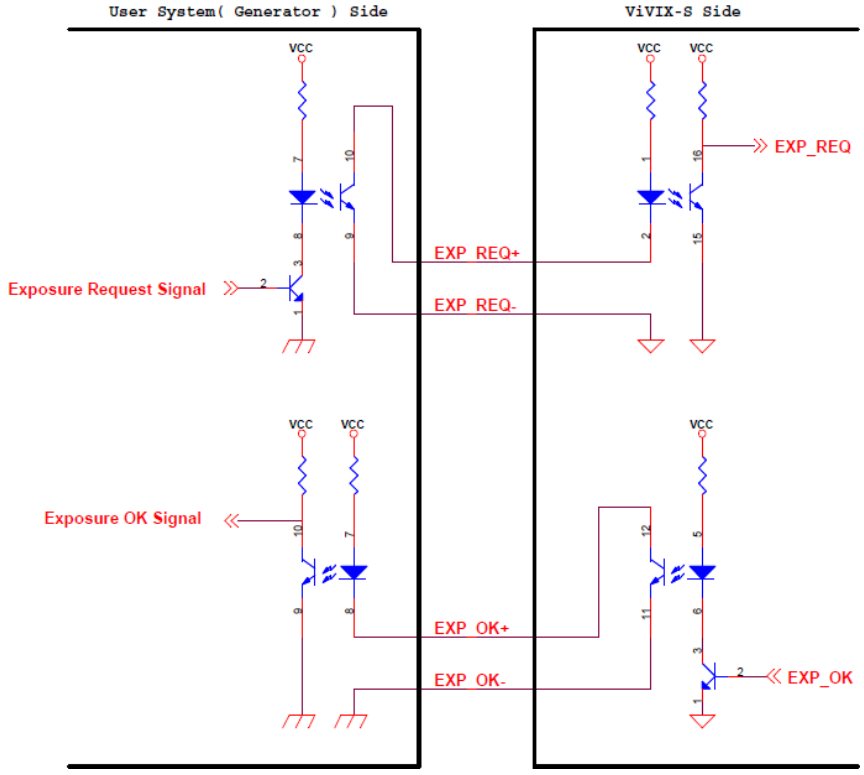


Figure 2.19 Contact Type Interface between the detector and X-ray generator

3. Packaging and Contents

Detector		PSU or SCU
FXRD-1717SA (B)	FXRD-1417SA (B)	
†		
AC Power Cable		**DC Power Cable (15M)**
Generator Interface Cable (15M)		**LAN Cable (Gigabit LAN, 15M)**
Ether Con Cable (3M or 12M) – Only for FXRD-1417SA (B)		
Installation Software CD		
Viewer:	QXvue	
Calibration SW:	ChameleonSetup	
Configure SW:	Configure	
	QXvue Configure DICOM	
Calibration Data		
† The case for the detector is sold separately.		

Table 3.1 ViVIX-S Packaging

4. How to Install

4.1 Hardware Installation

This section describes how to connect the flat panel imaging system (detector).

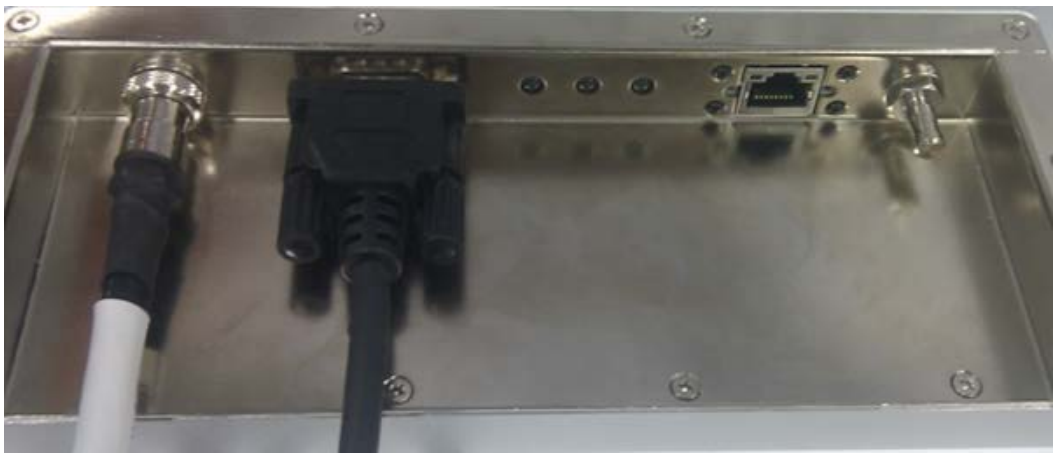
CAUTION	Installation of this equipment should be made by licensed and authorized personnel.

4.1.1 FXRD-1717SA (B)

1 Connect the DC Power Cable to the Power Connector of the Detector.

2 Connect the Generator Interface Cable to the D-SUB Connector of Detector.

The other side of Generator Interface Cable should be connected to Generator system.



3 Connect the Direct LAN Cable to the GigE Connector of the Detector.

4 The ground terminal and ground wires shall be done to ground before operating the system.
Connect the ground terminal and cable of the Detector to ground marked as following symbol.

The resistance between the ground terminal and ground shall be less than 0.1 ohms.

† The ground wire is not included in the ViVIX-S package.

5 Connect the other side of Direct LAN Cable to the LAN Card Connector of Workstation assigned for the Data Transfer.

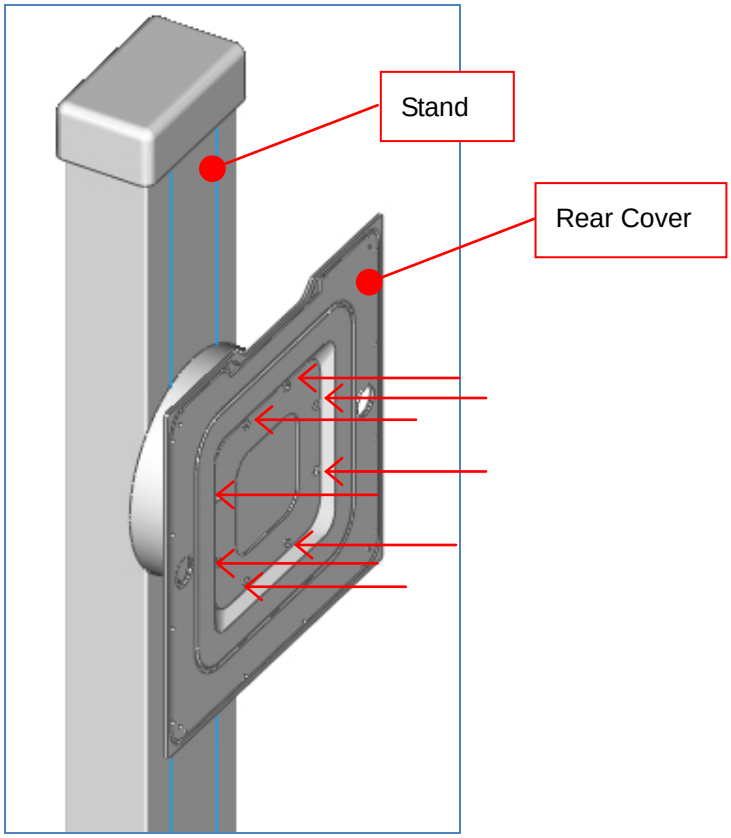
6 Connect the other side of DC Power Cable to the DC Power Output Connector of PSU and connect the power cable to the AC port of the PSU to supply power.

CAUTION	This equipment must only be connected to a supply mains with protective earth.

7 Turn on the power switch in front of the PSU.

4.1.2 Installing on a Stand

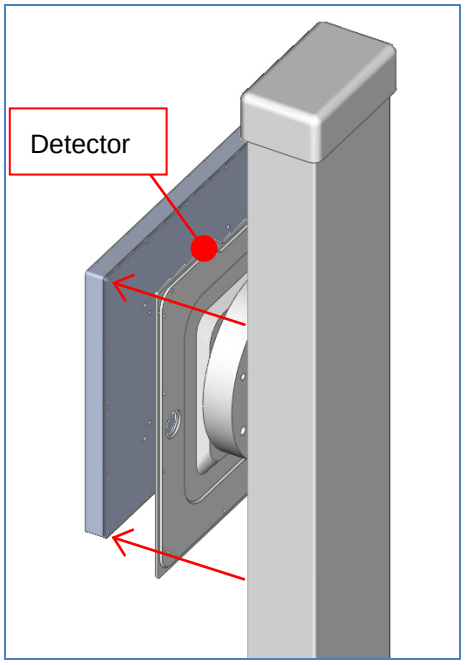
1 Install an exterior rear cover of detector on a stand.



	• Make sure that you use a rear cover provided by vieworks as an optional item or manufactured by distributors. • You must use the fixing screws provided with a stand or specified by stand manufacturer.

2 Mount the detector on the rear cover.

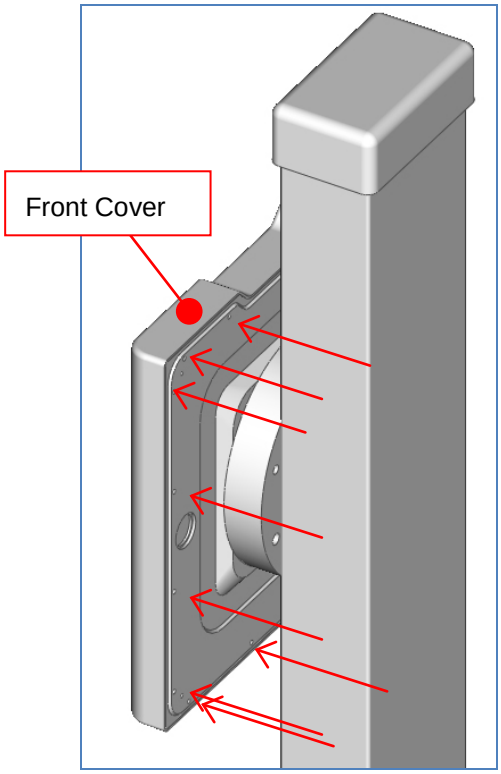
- Fasten the four fixing screws on the rear corner of the detector.



	When you mount the detector on the rear cover, use the following screws based on the cover provided by vieworks. • M5 X 15, High-Tension Bolt (Material: SCM435)

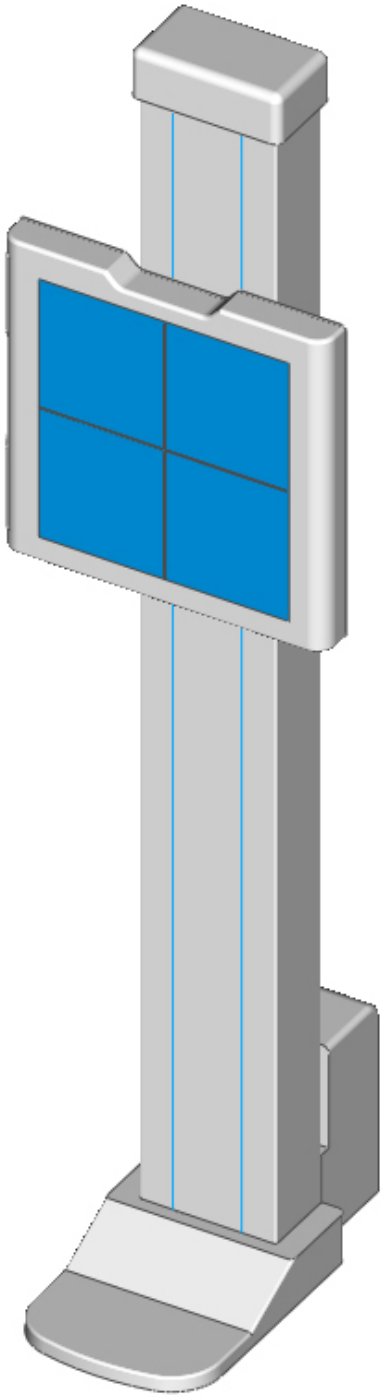
3 Fix the front cover to the rear cover.

- Fasten the fixing screws into the 16 holes designated on the rear cover.



	When you mount the front cover, use the following screws based on the cover provided by vieworks. • M4 X 10 (Metal Screw)

4 The following figure illustrates the completion of installing the detector on the stand.



CAUTION	Check the tightness of screws periodically to avoid dropping or detaching the detector from the stand.

4.1.3 FXRD-1417SA (B)

1 Connect the one end of Ether Con Cable to the port of detector, and the other to PORT1 of the System Control Unit (SCU).

2 Connect the one end of the X-ray generator cable to EXT_INF port of the SCU, and the other to the port of the X-ray generator system.

3 Connect the LAN cable to PORT2 ~ PORT5 of the SCU and the other to the LAN card connector of workstation assigned for the data transfer.

4 Connect the power cable to the AC port of the SCU to supply power.

CAUTION	This equipment must only be connected to a supply mains with protective earth.

5 Turn on the power switch in front of the SCU.

4.2 Software Installation

4.2.1 Intel Gigabit Controller Driver Installation and Setting

	Before installing Intel Gigabit Controller Driver, make sure your Ethernet Card is properly installed on the workstation. The recommended Ethernet Card is Intel® Gigabit CT and Ethernet Cards supporting 1Gbps or higher are also available (However, Receive Packet must support more than 1,024.).

	This is not a component of ViVIX-S but recommend component. So, you have to use installation package designed for your Gigabit Controller. 1~8 steps may differ according to Gigabit Controller to use. Following procedures are provided as an example to refer to.

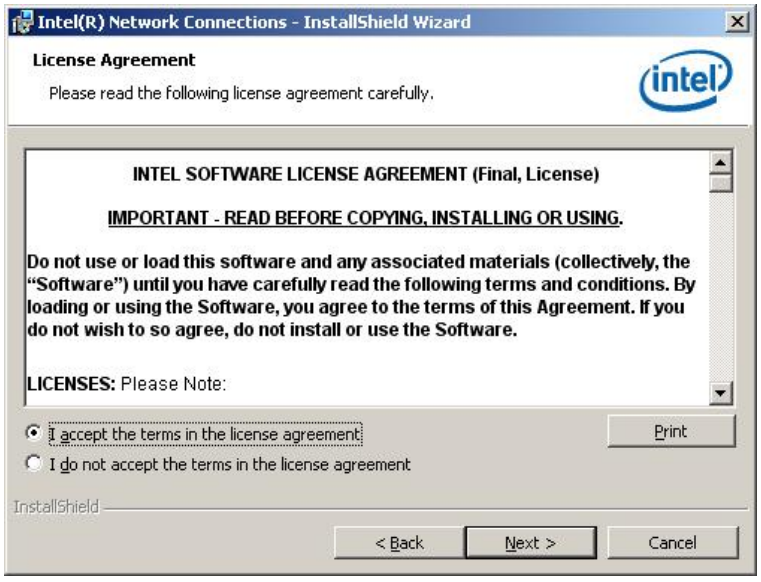
1 Click **PROXP.exe** to start InstallShield Wizard, and then click the **Run** button.

Open File - Security Warning
Do you want to run this file?
Name: PROXP.exe
Publisher: Intel Corporation
Type: Application
From: D:\Programs\GigE
Run
Cancel
Always ask before opening this file
While files from the Internet can be useful, this file type can potentially harm your computer. Only run software from publishers you trust. What's the risk?

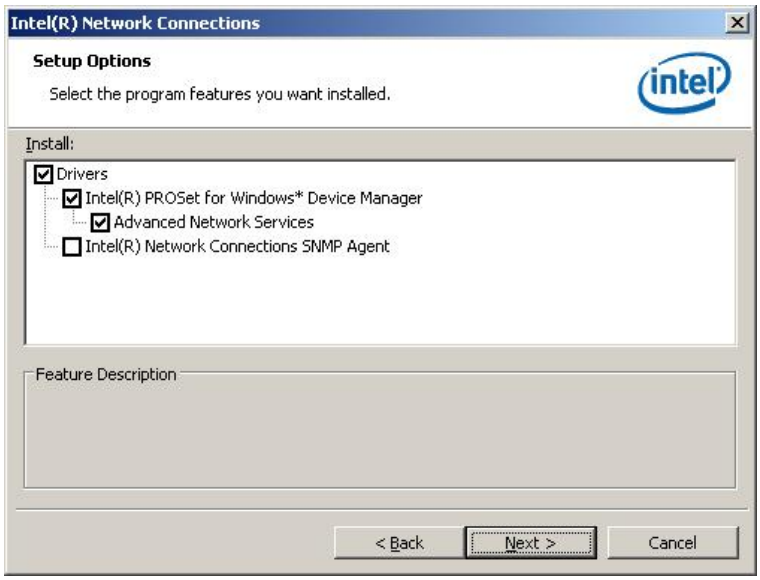
2 Click the **Next** button.

Intel(R) Network Connections - InstallShield Wizard
Welcome to the InstallShield Wizard for
Intel(R) Network Connections
Installs drivers, Intel(R) PROSet for Windows* Device Manager, and Advanced Networking Services.
WARNING: This program is protected by copyright law and international treaties.
InstallShield
< Back
Next >
Cancel

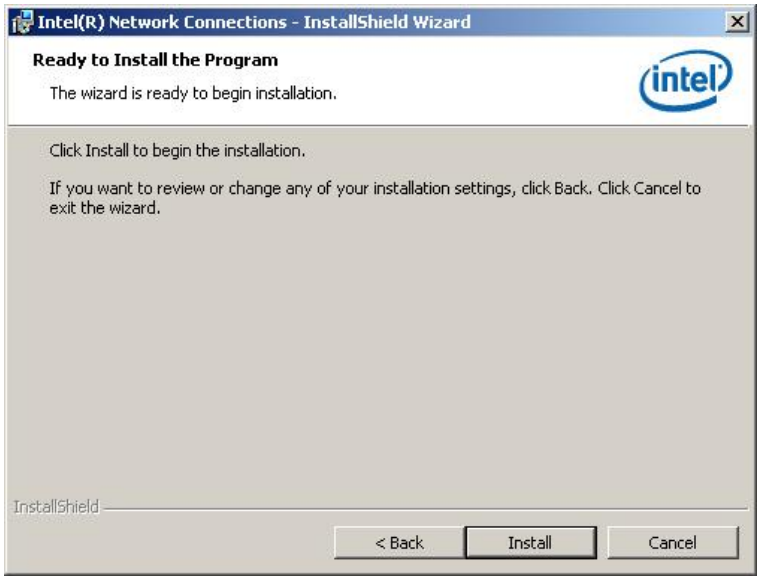
3 Accept the license agreement and click the **Next** button.


Intel(R) Network Connections - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
INTEL SOFTWARE LICENSE AGREEMENT (Final, License)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
LICENSES: Please Note:
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

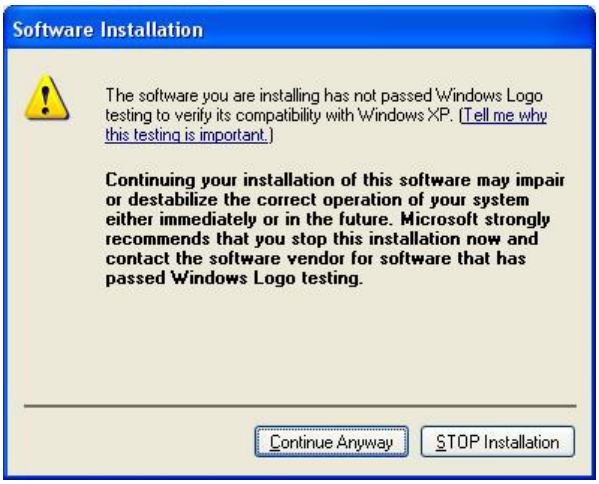
4 Select the components to install and click the **Next** button.



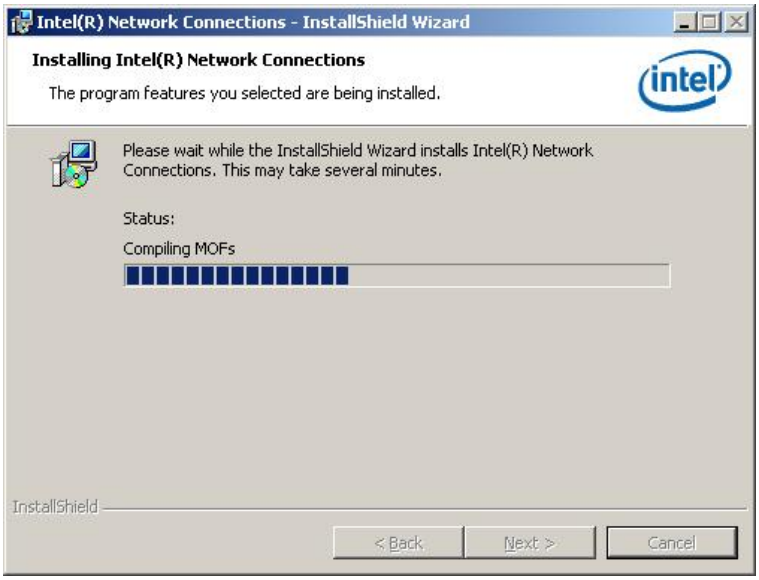
5 Click the **Install** button.


Intel(R) Network Connections - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

6 When the following message appears, click the **Continue Anyway** button.


Software Installation
The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

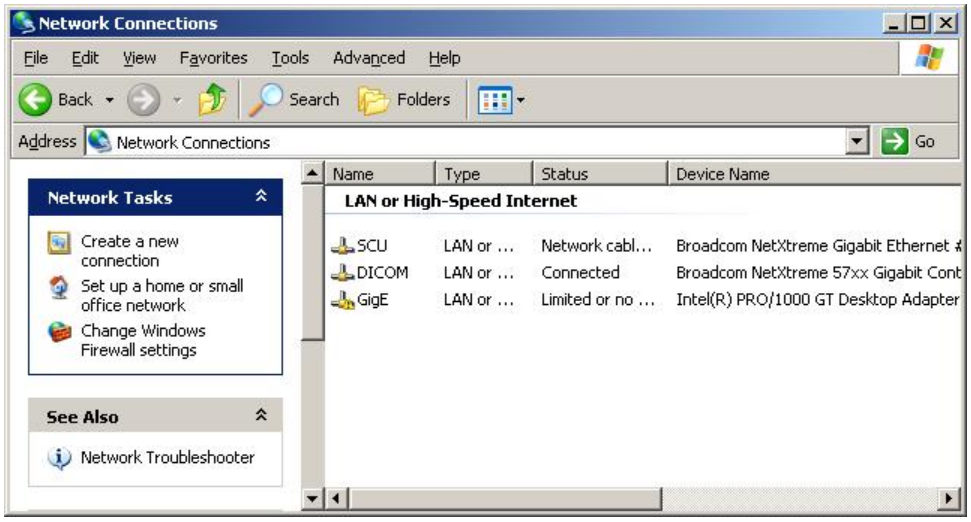
7 Installation status bar appears in Installing **Intel® Network Connections** dialog box.


Intel(R) Network Connections - InstallShield Wizard
Installing Intel(R) Network Connections
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs Intel(R) Network Connections. This may take several minutes.
Status:
Compiling MOFs
InstallShield
< Back
Next >
Cancel

8 Click the **Finish** button.

4.2.2 Gigabit Controller Setting on Windows XP

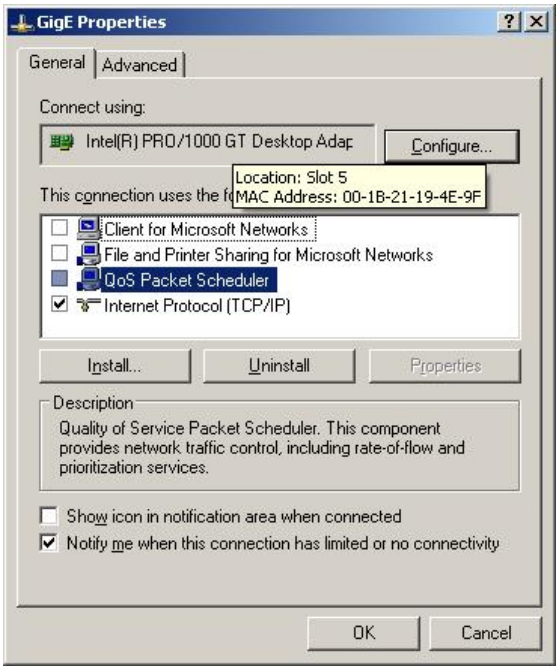
1 Click **Start** > **Setting** > **Control Panel** > **Network Connections** to open the **Network Connections** dialog box, and then rename **Local Area Connection** with **GigE**.


Network Connections
File Edit View Favorites Tools Advanced Help
Back Search Folders
Address Network Connections
Go
Network Tasks
Create a new connection
Set up a home or small office network
Change Windows Firewall settings
See Also
Network Troubleshooter
Name Type Status Device Name
LAN or High-Speed Internet
SCU LAN or ... Network cabl... Broadcom NetXtreme Gigabit Ethernet #
DICOM LAN or ... Connected Broadcom NetXtreme 57xx Gigabit Cont
GigE LAN or ... Limited or no ... Intel(R) PRO/1000 GT Desktop Adapter

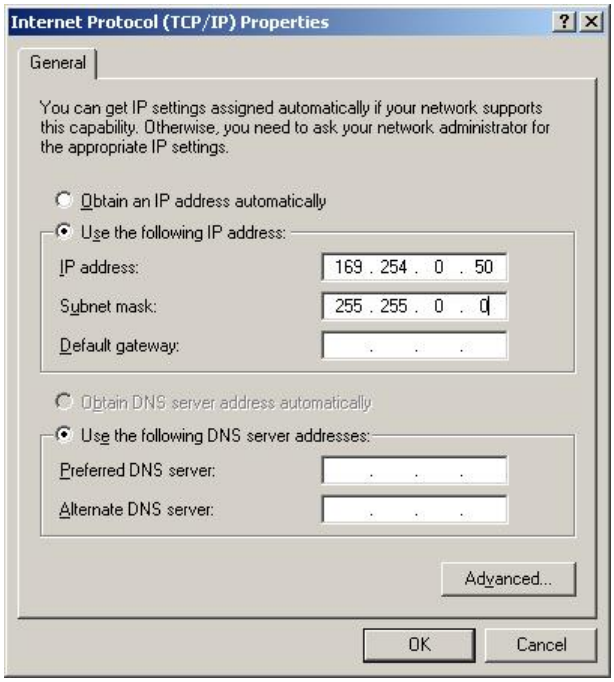
	It is not necessary to change name with GigE. It just distinguishes between that connection and other connections.

2 Right-click the **GigE** and then click the **Properties**.

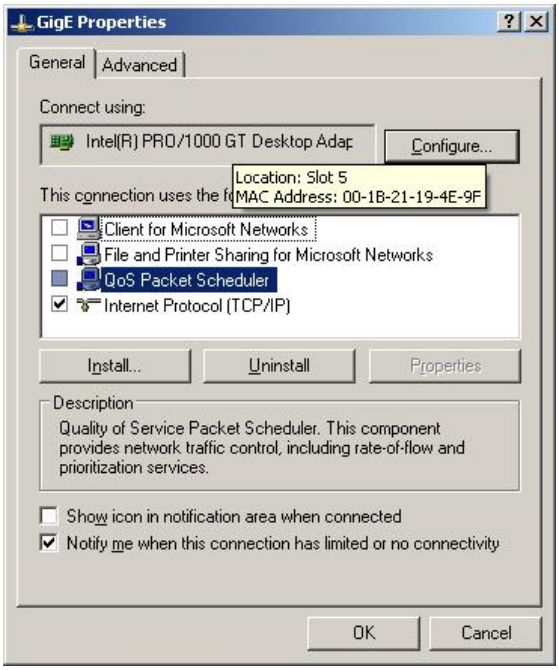
3 Uncheck all checkboxes except **Vieworks Image Filter Driver** or **GigaLinx Image Filter Driver** and **Internet Protocol [TCP/IP]**.



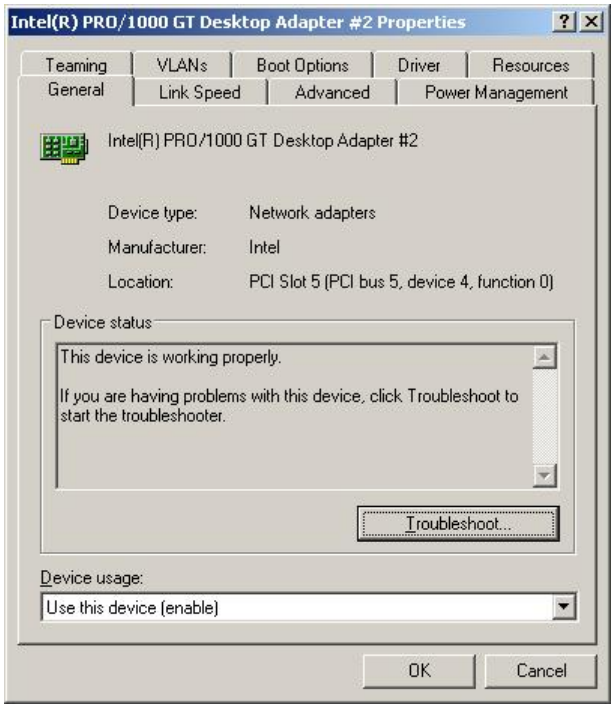
4 Click the **Internet Protocol [TCP/IP]** and set the IP as shown below, and then click the **OK** button. The last octet of the IP address must be in the range of 50 to 254.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 169 . 254 . 0 . 50
Subnet mask: 255 . 255 . 0 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

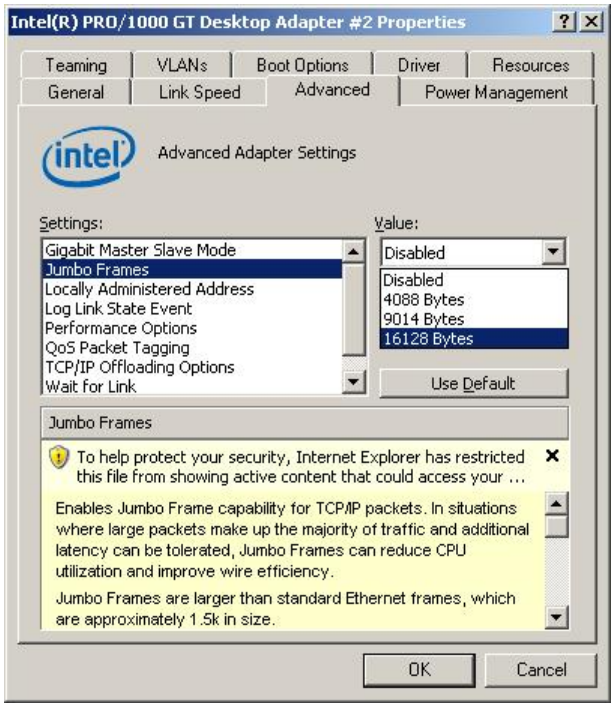
5 Click the **OK** button to close the dialog box.



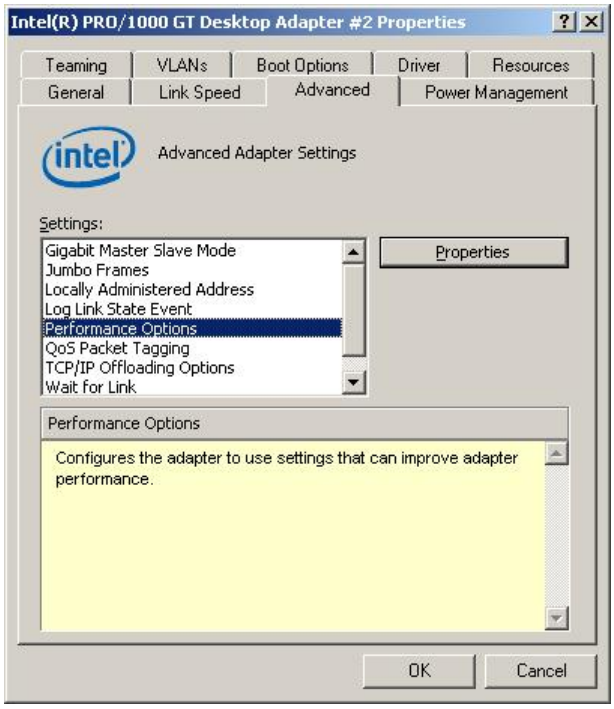
6 Click **Start** > **Setting** > **Control Panel** > **Network Connections** to open the **Network Connections** dialog box, and right-click **GigE**, and then click **Properties** to open the **GigE Properties** dialog box. Click the **Configure** button to open the following dialog box, and then go to the **Advanced** tab.



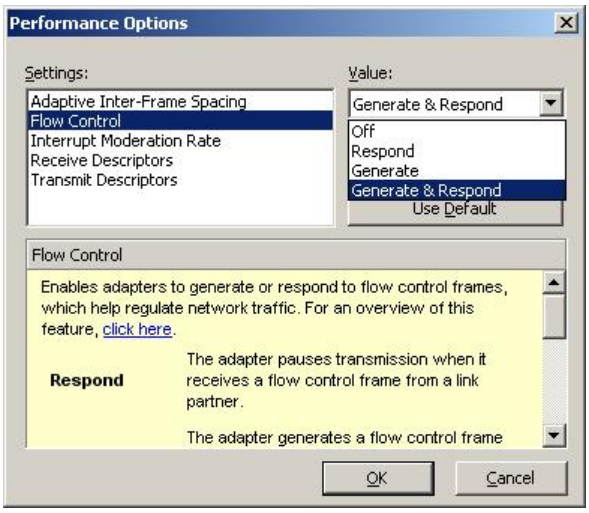
7 Set the **Jumbo Frames** to the maximum value.



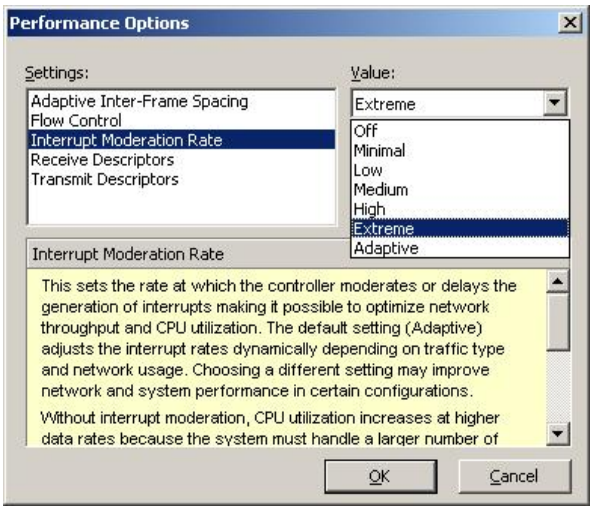
8 Choose **Performance Options** in the list of **Settings** and click the **Properties** button on the right.



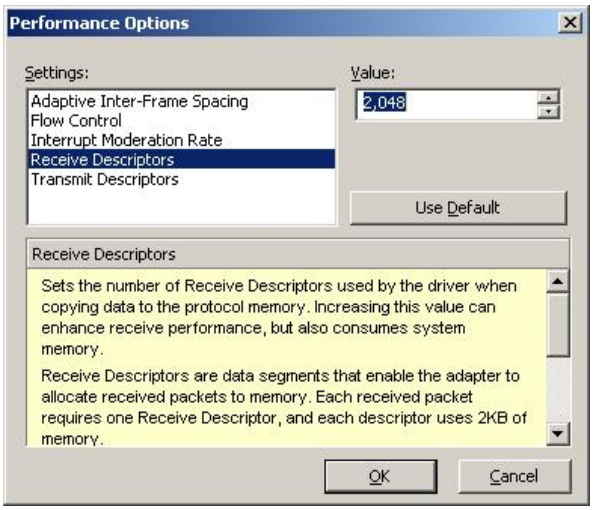
9 Choose **Flow Control** in the list of **Settings** and **Generate & Respond** in the list of **Value** as shown below.



10 Choose **Interrupt Moderation Rate** in the list of **Settings** and **Extreme** in the list of **Value** as shown below.


Performance Options
Settings:
Adaptive Inter-Frame Spacing
Flow Control
Interrupt Moderation Rate
Receive Descriptors
Transmit Descriptors
Value:
Extreme
Off
Minimal
Low
Medium
High
Extreme
Adaptive
Interrupt Moderation Rate
This sets the rate at which the controller moderates or delays the generation of interrupts making it possible to optimize network throughput and CPU utilization. The default setting (Adaptive) adjusts the interrupt rates dynamically depending on traffic type and network usage. Choosing a different setting may improve network and system performance in certain configurations.
Without interrupt moderation, CPU utilization increases at higher data rates because the system must handle a larger number of
OK
Cancel

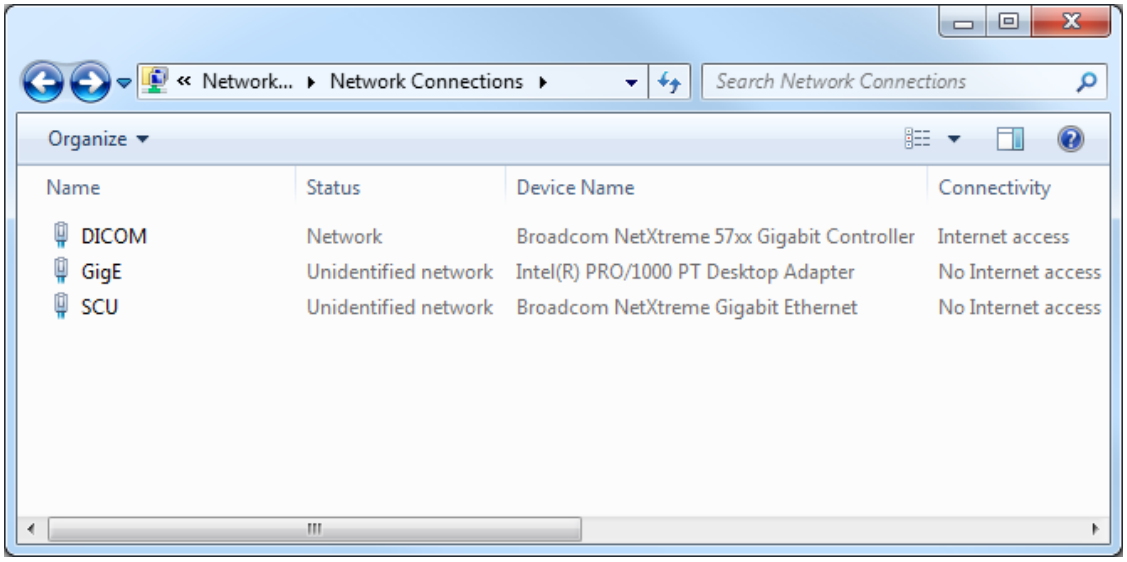
11 Choose **Receive Descriptors** and set to the maximum value.


Performance Options
Settings:
Value:
Adaptive Inter-Frame Spacing
Flow Control
Interrupt Moderation Rate
Receive Descriptors
Transmit Descriptors
2,048
Use Default
Receive Descriptors
Sets the number of Receive Descriptors used by the driver when copying data to the protocol memory. Increasing this value can enhance receive performance, but also consumes system memory.
Receive Descriptors are data segments that enable the adapter to allocate received packets to memory. Each received packet requires one Receive Descriptor, and each descriptor uses 2KB of memory.
OK
Cancel

12 Click the **OK** button to close the window.

4.2.3 Gigabit Controller Setting on Windows 7

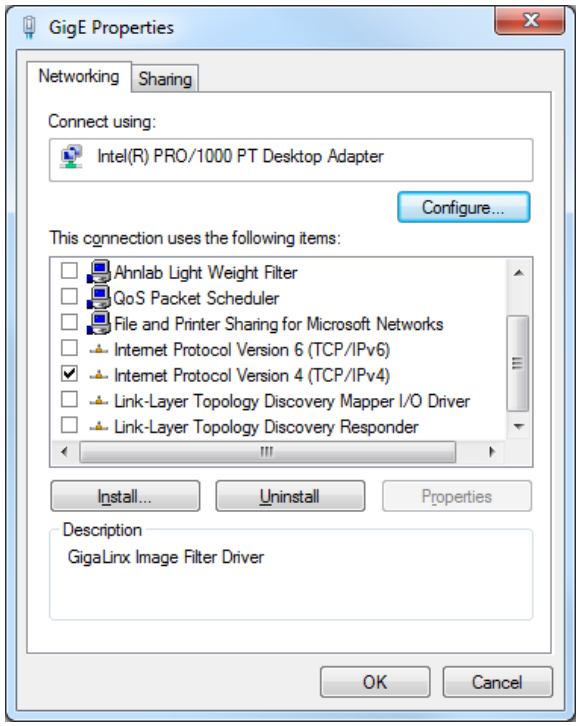
1 Click **Start** > **Control Panel** > **Network and Internet** > **Network and Sharing Center** > **Change Adapter Setting** and then rename **Local Area Connection** with **GigE**.



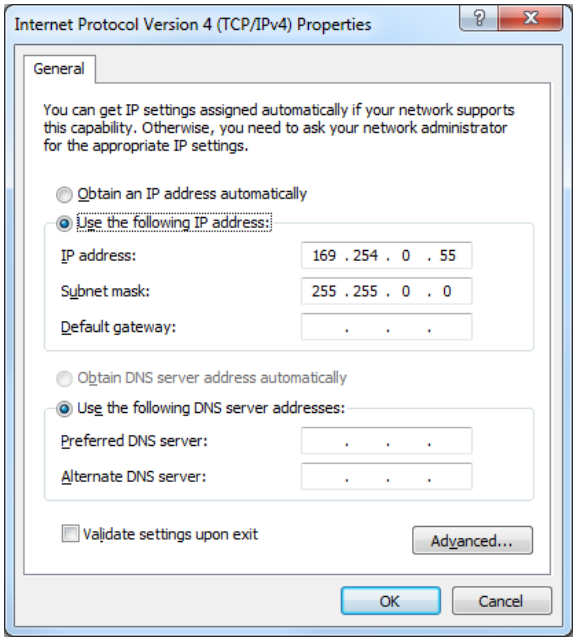
	It is not necessary to change name with GigE. It just distinguishes between that connection and other connections.

2 Right-click the **GigE** and then click the **Properties**.

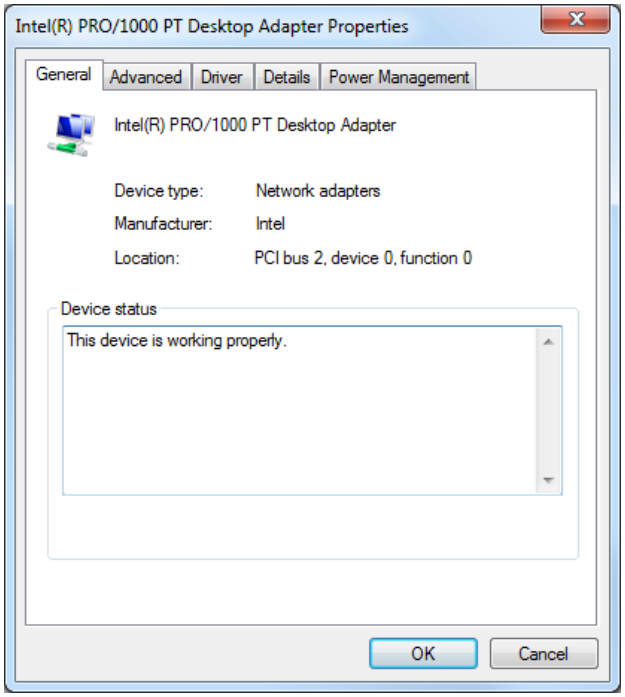
3 Uncheck all checkboxes except **Vieworks Image Filter Driver** or **GigaLinx Image Filter Driver** and **Internet Protocol [TCP/IP]**.



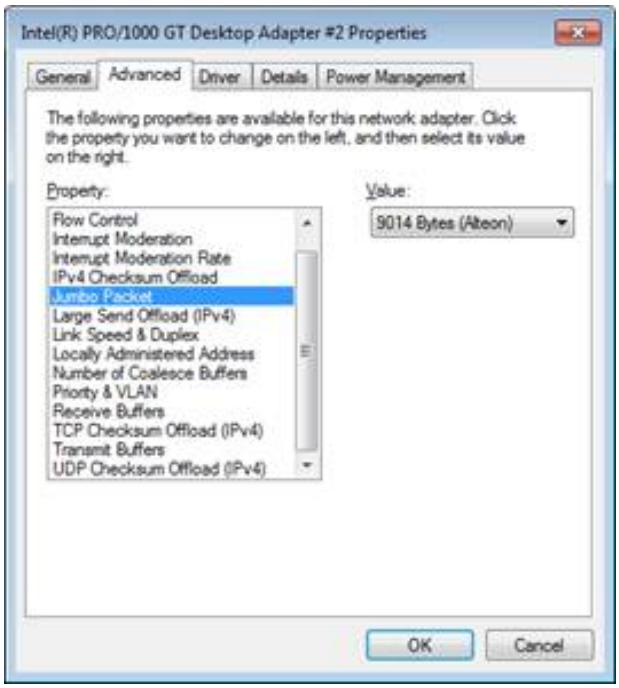
4 Click the **Internet Protocol [TCP/IP]** and set the IP as shown below, and then click the **OK** button. The last octet of the IP address must be in the range of 50 to 254.


Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 169 . 254 . 0 . 55
Subnet mask: 255 . 255 . 0 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

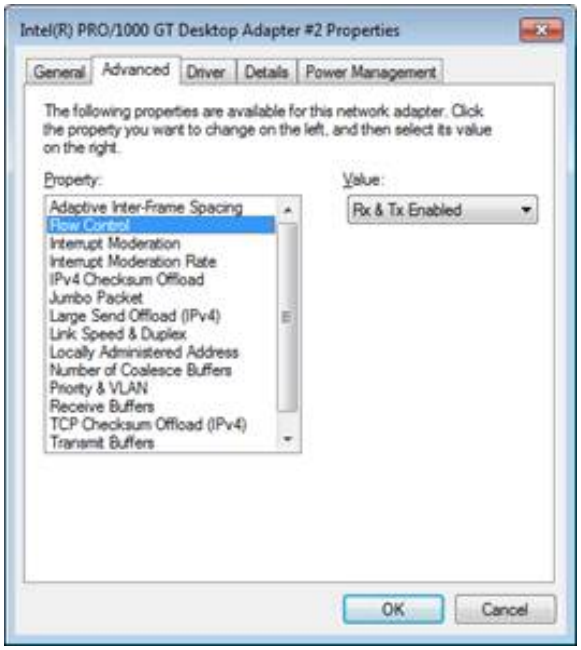
5 Click **Start** > **Control Panel** > **Network and Internet** > **Network and Sharing Center** > **Change Adapter Setting**, right-click **GigE**, and then click **Properties** to open the **GigE Properties** dialog box. Click the **Configure** button to open the following dialog box, and then go to the **Advanced** tab.



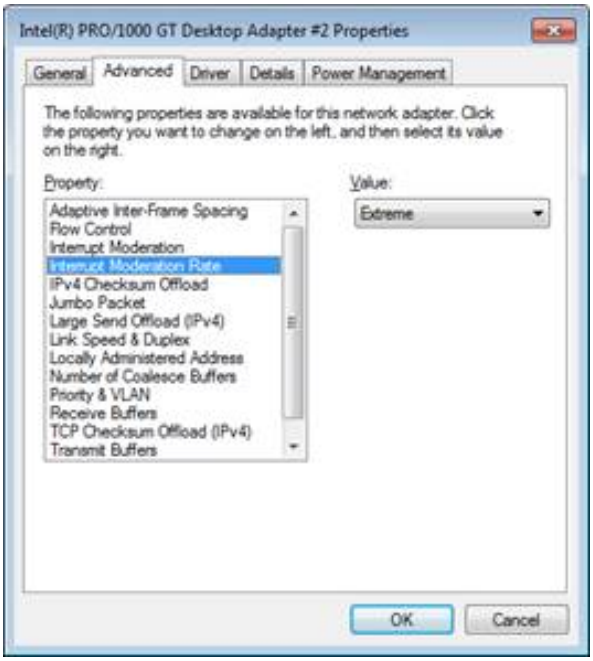
6 Set the **Jumbo Packet** to the maximum value.



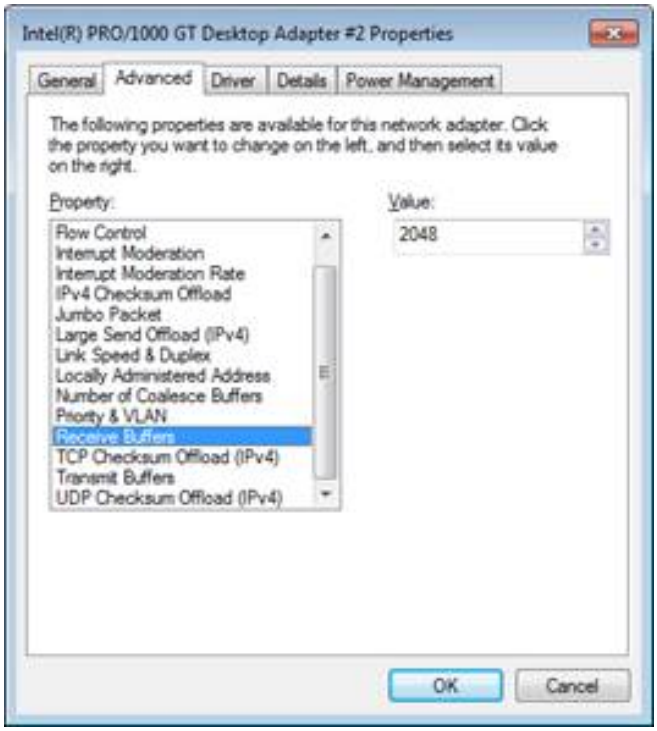
7 Choose **Flow Control** in the list of **Property** and select **Rx & Tx Enabled** in the list of **Value** as shown below.



8 Choose **Interrupt Moderation Rate** in the list of **Property** and **Extreme** in the list of **Value** as shown below.



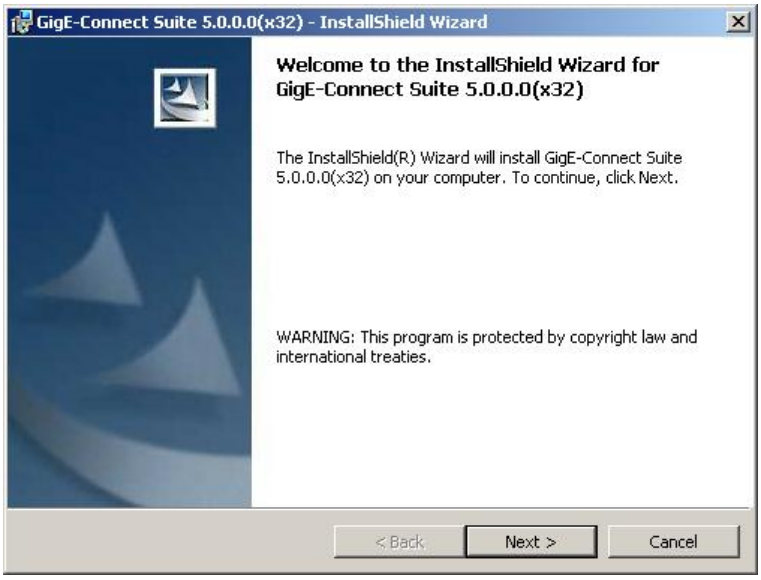
9 Choose **Receive Buffers** and set to the maximum value.



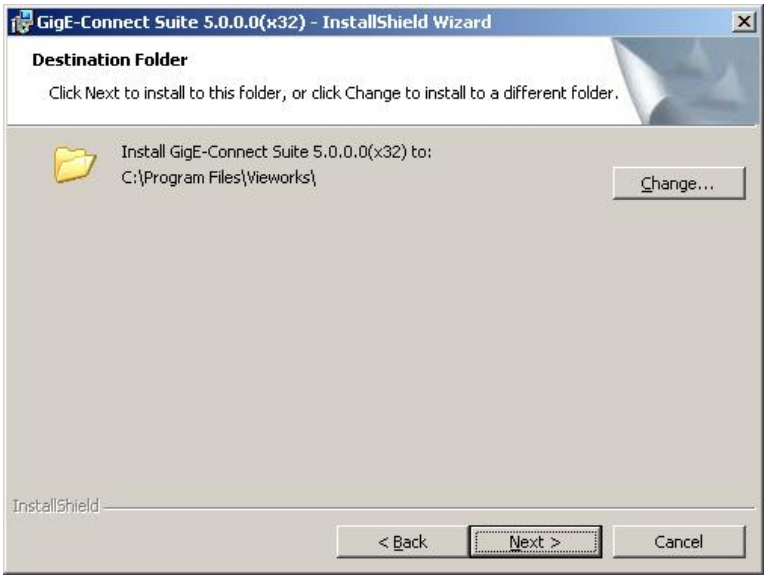
10 Click the **OK** button.

4.2.4 Vieworks Imaging Solution/GigE-Connect Suite Installation

1 Run **Vieworks Imaging Solution 5.x.x.x(x32).exe** or **GigE-Connect_Suite_Plus_5.x.x.x(x32).exe** and click the **Next** button in the InstallShield Wizard dialog box.


GigE-Connect Suite 5.0.0.0(x32) - InstallShield Wizard
Welcome to the InstallShield Wizard for GigE-Connect Suite 5.0.0.0(x32)
The InstallShield(R) Wizard will install GigE-Connect Suite 5.0.0.0(x32) on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

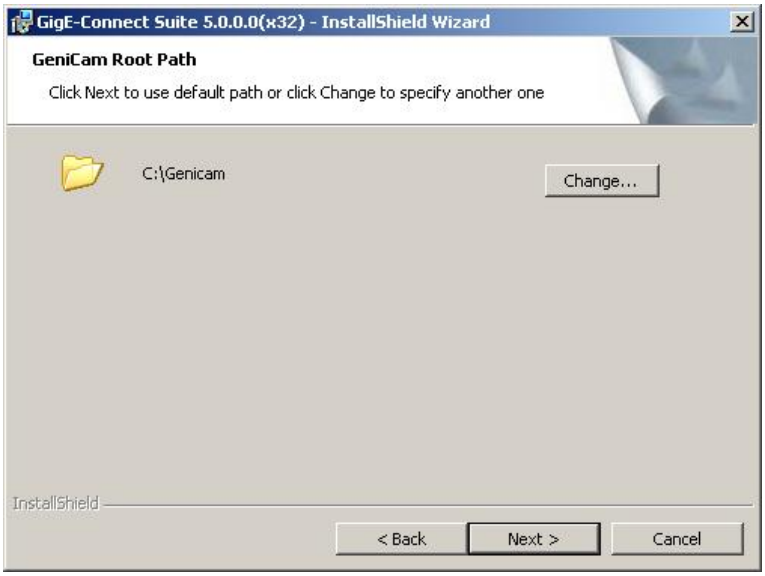
2 Click the **Next** button.


GigE-Connect Suite 5.0.0.0(x32) - InstallShield Wizard
Destination Folder
Click Next to install to this folder, or click Change to install to a different folder.
Install GigE-Connect Suite 5.0.0.0(x32) to:
C:\Program Files\Vieworks\
Change...
InstallShield
< Back
Next >
Cancel

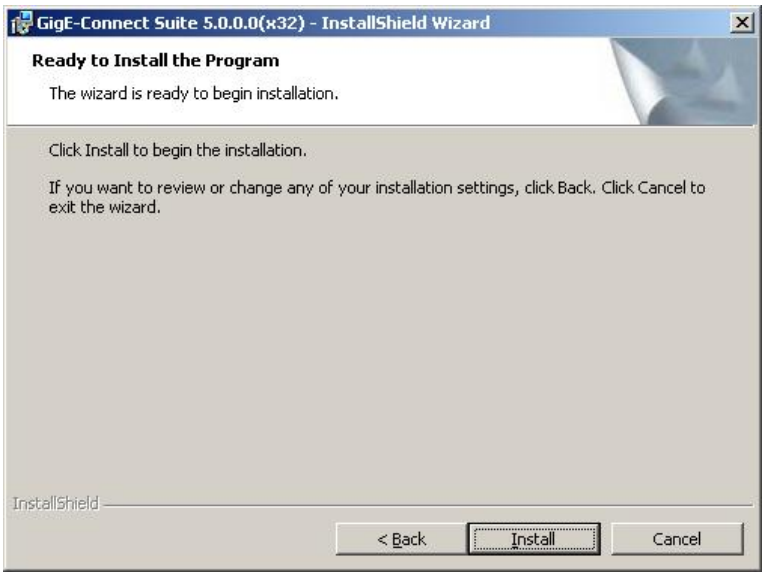
3 Choose **Complete** for Setup Type and click the **Next** button.

GigE-Connect Suite 5.0.0.0(x32) - InstallShield Wizard
Setup Type
Choose the setup type that best suits your needs.
Please select a setup type.
Complete
All program features will be installed. (Requires the most disk space.)
Custom
Choose which program features you want installed and where they will be installed. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel

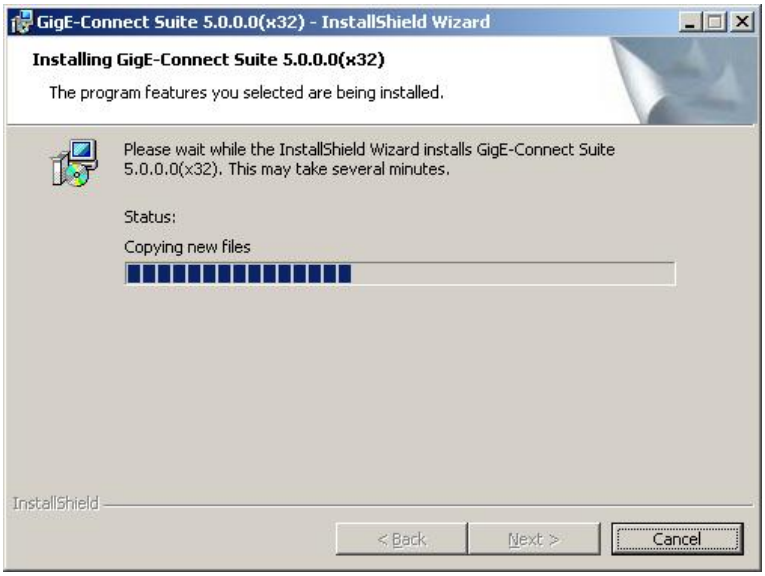
4 Click the **Next** button.



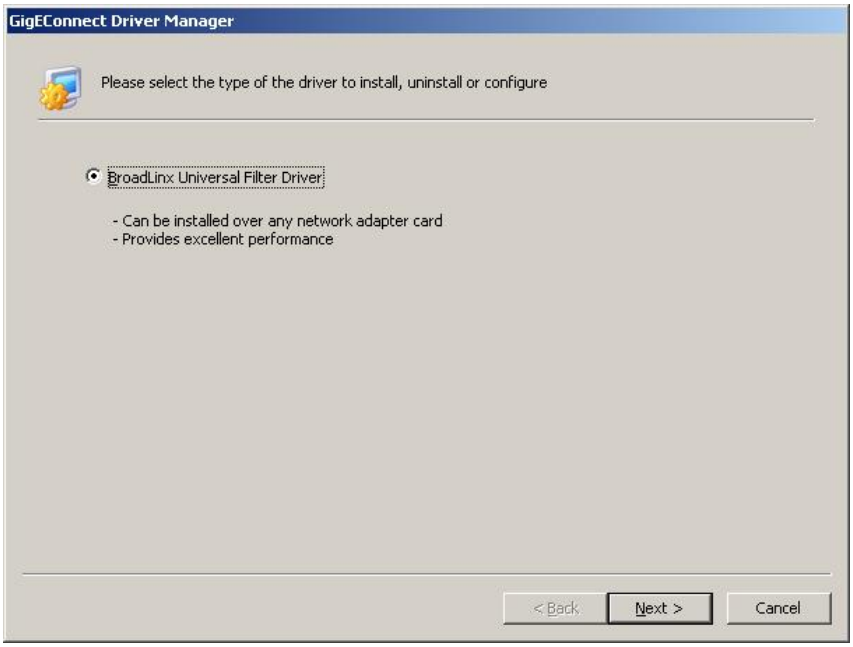
5 Click the **Install** button.


GigE-Connect Suite 5.0.0.0(x32) - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

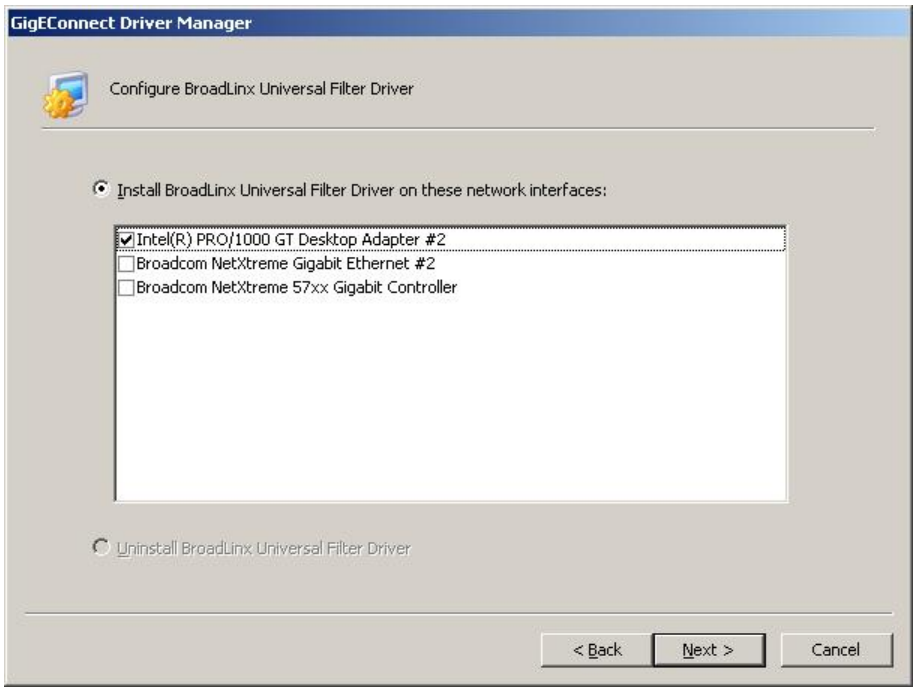
6 InstallShield Wizard starts to install GigE-Connect Suite as shown below.


GigE-Connect Suite 5.0.0.0(x32) - InstallShield Wizard
Installing GigE-Connect Suite 5.0.0.0(x32)
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs GigE-Connect Suite 5.0.0.0(x32). This may take several minutes.
Status:
Copying new files
InstallShield
< Back
Next >
Cancel

7 Click the **Next** button.


GigEConnect Driver Manager
Please select the type of the driver to install, uninstall or configure
BroadLinx Universal Filter Driver
- Can be installed over any network adapter card
- Provides excellent performance
< Back
Next >
Cancel

8 Check **Intel® PRO/1000 GT Desktop Adapter** and click the **Next** button.

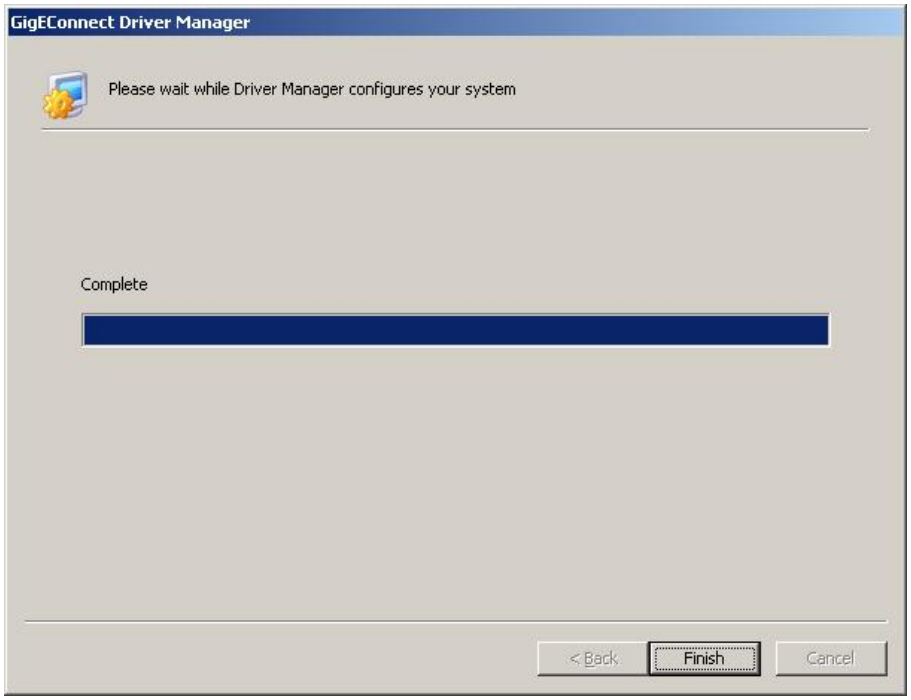

GigEConnect Driver Manager
Configure BroadLinx Universal Filter Driver
Install BroadLinx Universal Filter Driver on these network interfaces:
Intel(R) PRO/1000 GT Desktop Adapter #2
Broadcom NetXtreme Gigabit Ethernet #2
Broadcom NetXtreme 57xx Gigabit Controller
Uninstall BroadLinx Universal Filter Driver
< Back
Next >
Cancel

These procedures are an example to refer to, so you have to select installed Gigabit Controller.

9 Click **Continue Anyway** in the Hardware Installation dialog box.

Hardware Installation
The software you are installing for this hardware:
Vieworks Image Filter Driver
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

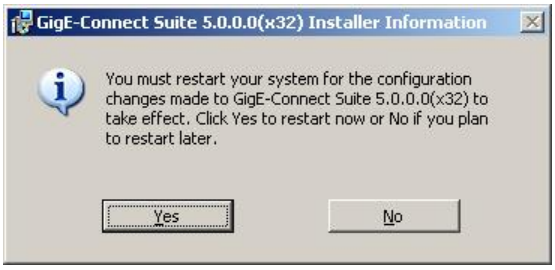
10 Click the **Finish** button.



11 Click the **Finish** button.

GigE-Connect Suite 5.0.0.0(x32) - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed GigE-Connect Suite 5.0.0.0(x32). Click Finish to exit the wizard.
< Back
Finish
Cancel

12 Click **Yes** in the Installer Information dialog box to restart your computer.


GigE-Connect Suite 5.0.0.0(x32) Installer Information
You must restart your system for the configuration changes made to GigE-Connect Suite 5.0.0.0(x32) to take effect. Click Yes to restart now or No if you plan to restart later.
Yes
No

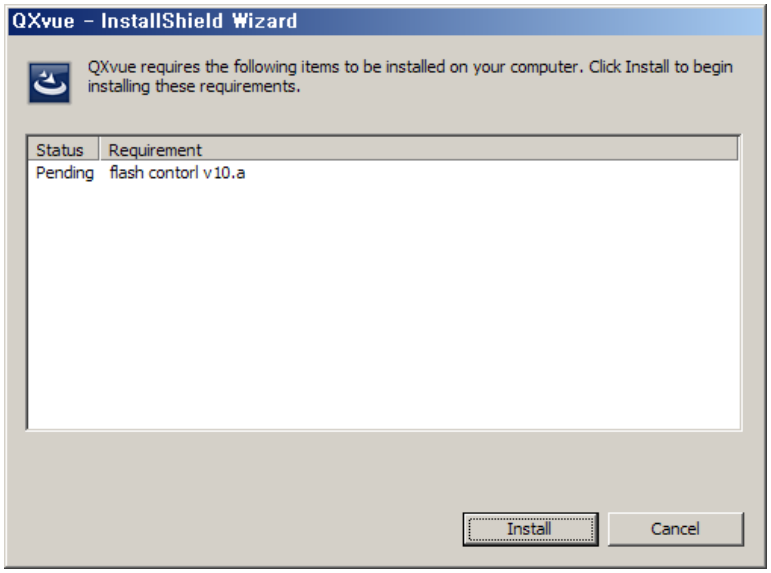
4.2.5 QXvue Installation

CAUTION	User must follow instructions below to protect against cyber security threats such as virus and worms. • Prior to installing and using QXvue, scan the computer system with anti-virus software to make sure the system is virus free. • Install, setup and enable adequate anti-virus software. • The operating system should be updated frequently to protect QXvue against harmful activities. • If you have a cyber security problem, contact the manufacturer on the phone or by e-mail referring to the contact information in this manual.

	• If you want to use a consol feature in QXvue, you need to manually install a flash control. • The hard disk must be divided into C and D drive or partitioned. D drive must have at least 5% free space available at this time. • For Windows XP, the files for East Asian languages must be installed. ▫ **Start** > **Control Panel** > **Regional and Language Options** > **Languages** tab, under **Supplemental language support,** select the **Install files for East Asian languages** check box.

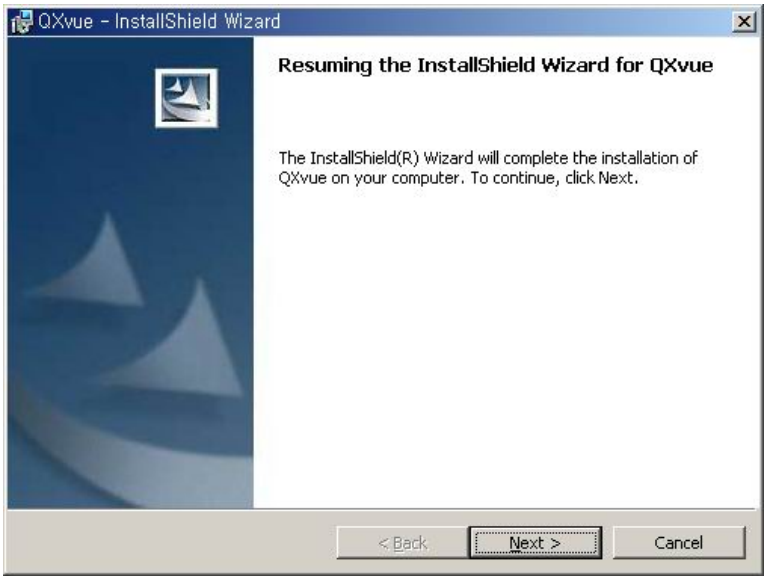
1 Insert the CD/DVD into the CD Drive.

2 Run **Setup.exe** and proceed with installation steps in the InstallShield Wizard dialog box. If it fails to install **flash control v10.a**, manually install the flash control by clicking Install.

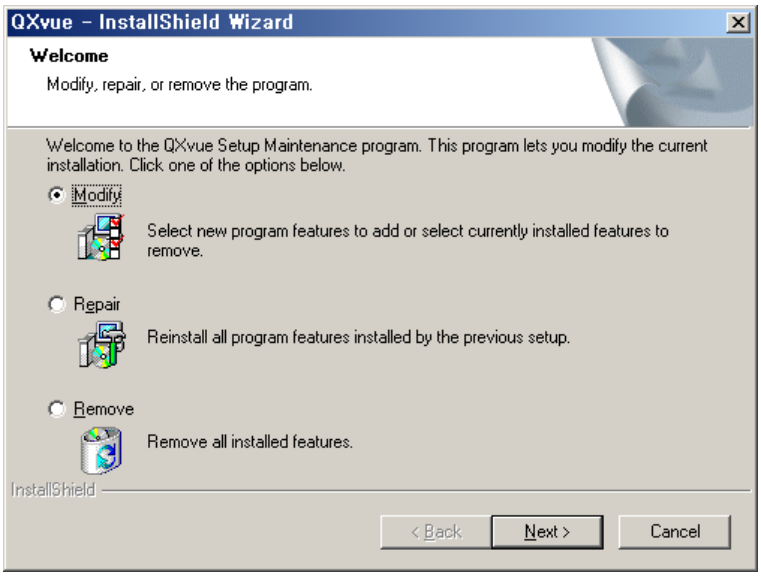


3 If the currently installed QXvue is earlier version, **Upgrade** notification window appears.

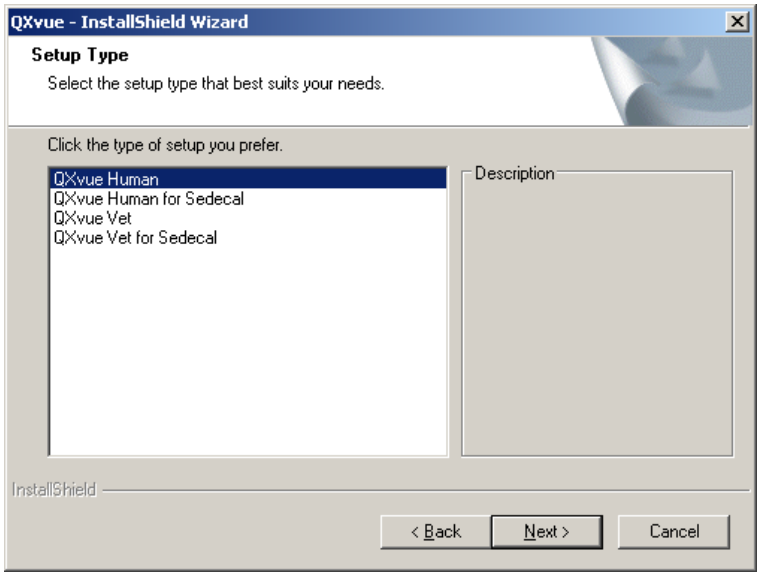
4 Click the **Next** button in the InstallShield Wizard dialog box.


QXvue - InstallShield Wizard
Resuming the InstallShield Wizard for QXvue
The InstallShield(R) Wizard will complete the installation of QXvue on your computer. To continue, click Next.
< Back
Next >
Cancel

5 If the QXvue has been already installed, you will see the following dialog box.

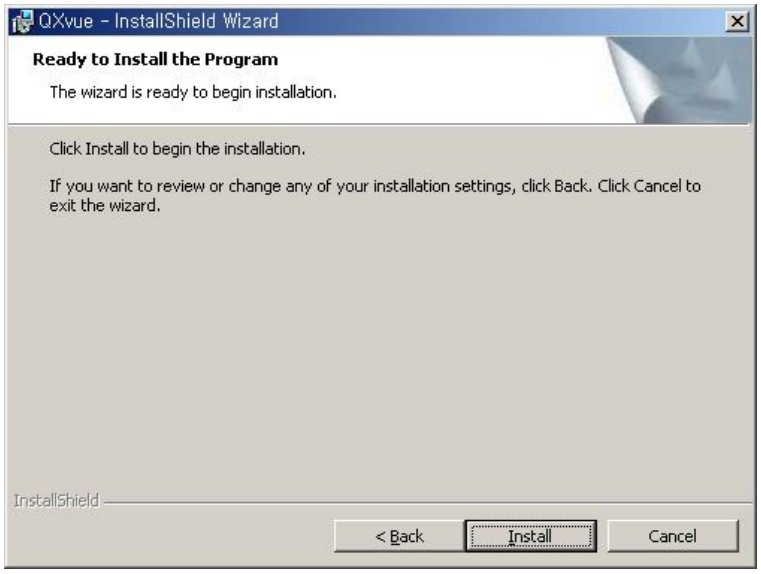

QXvue - InstallShield Wizard
Welcome
Modify, repair, or remove the program.
Welcome to the QXvue Setup Maintenance program. This program lets you modify the current installation. Click one of the options below.
Modify
Select new program features to add or select currently installed features to remove.
Repair
Reinstall all program features installed by the previous setup.
Remove
Remove all installed features.
InstallShield
< Back
Next >
Cancel

6 Choose the **QXvue Human** and click the **Next** button.

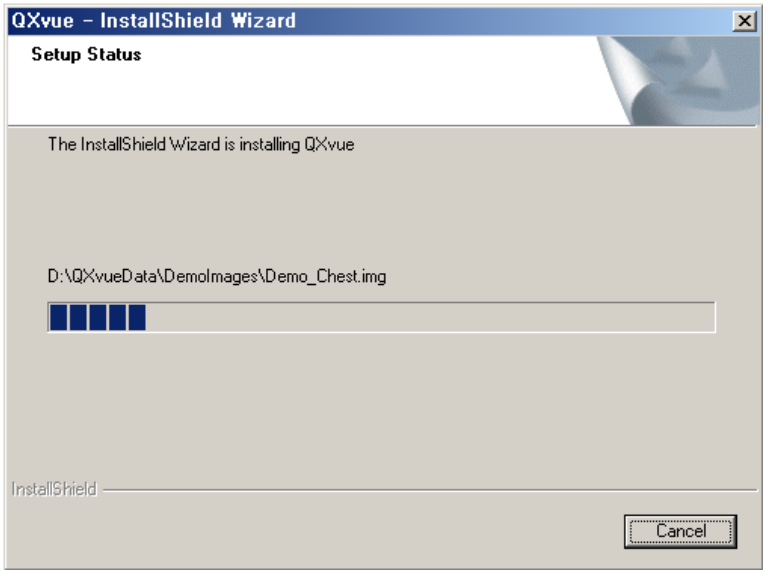


7 Click to confirm your selection.

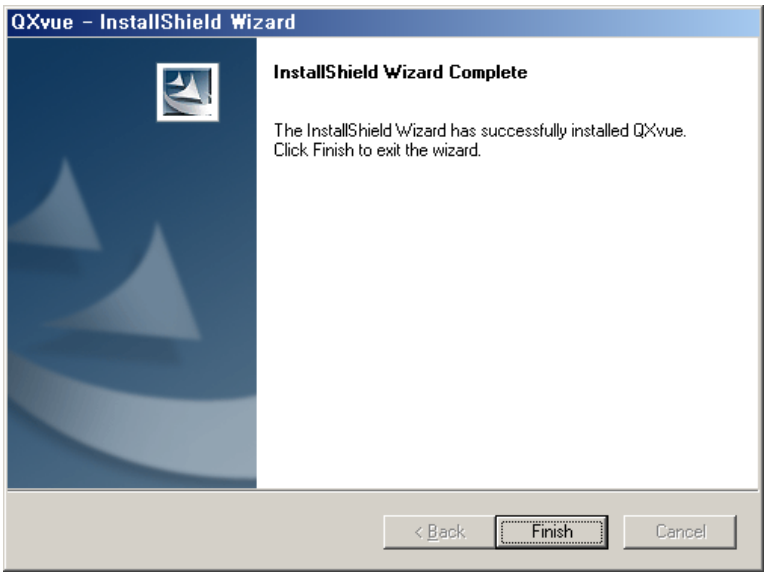
8 If the program is ready to install, click the **Install** button.


QXvue - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

9 The **Setup Status** appears with a progress bar.



10 Click the **Finish** button when the installation is done.



11 Now the **QXvue** software and data are successfully installed in each directory as shown below.

- Software C:\program files\
- Image Data D:\QXvueData or C:\QXvueData

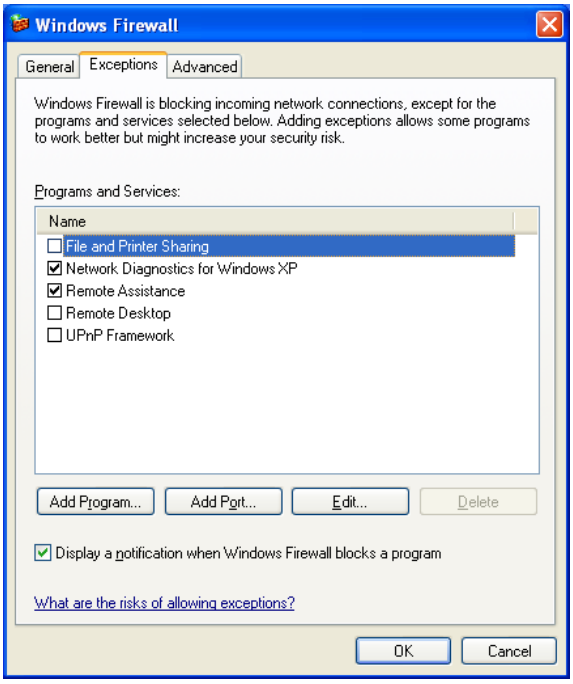
	If **Demo Version** has been installed, image data folder will be C:\QXvueData. **TBD**

- Executable File
  - QXvue.exe Viewer
  - ChameleonSetup.exe Calibration Software
  - Configure.exe Configuration Software
  - QXvueConfigure_DICOM.exe DICOM Configuration Software

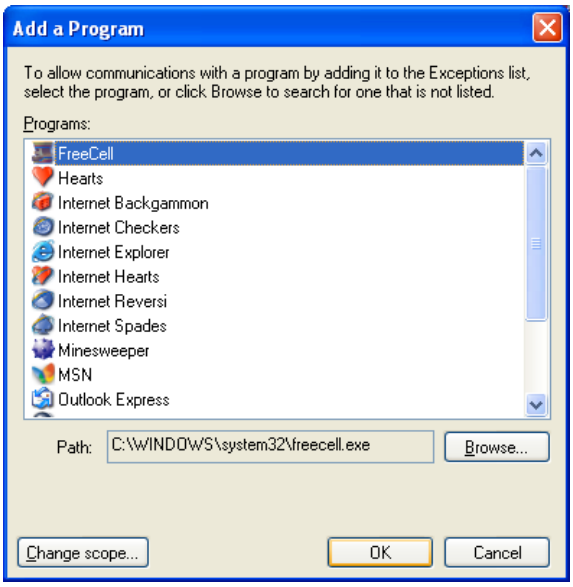
4.2.6 Allowing QXvue to communicate through Windows Firewall on Windows XP

1 Click **Start** > **Setting** > **Control Panel** > **Windows Firewall** and then click the **Exceptions** tab.

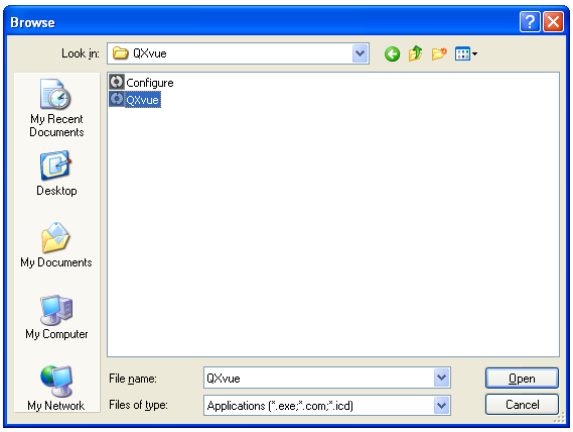
2 Click the **Add Program…** button.



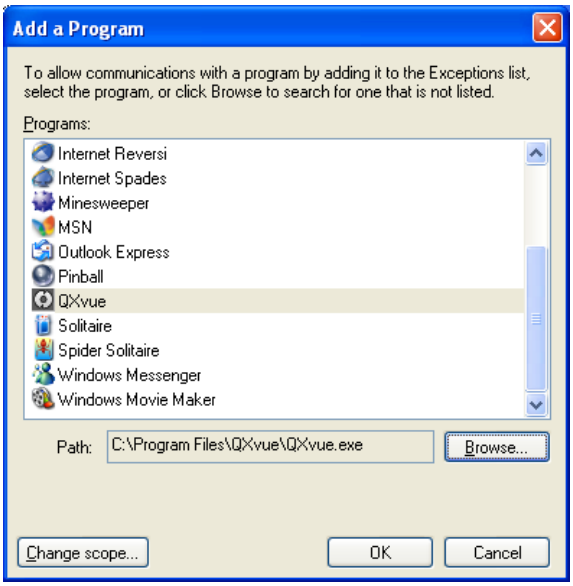
3 Click the **Browse** button and locate C:\Program files\QXvue\QXvue.



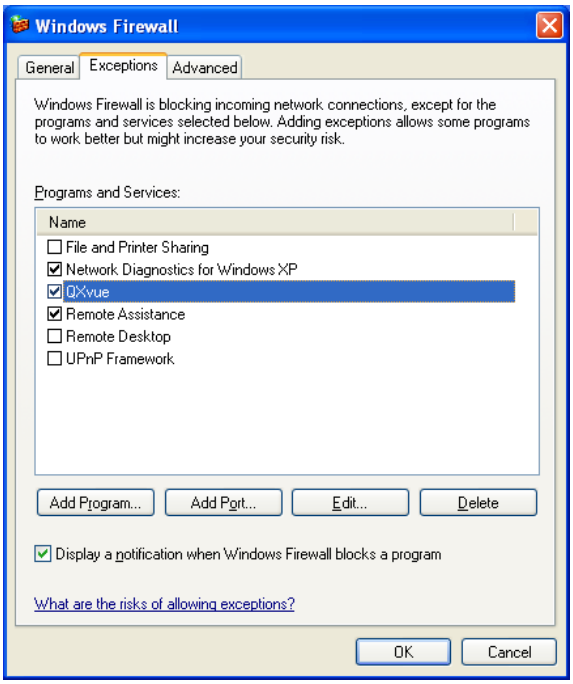
4 Click the **Open** button.



5 Select the **QXvue** and then click the **OK** button.



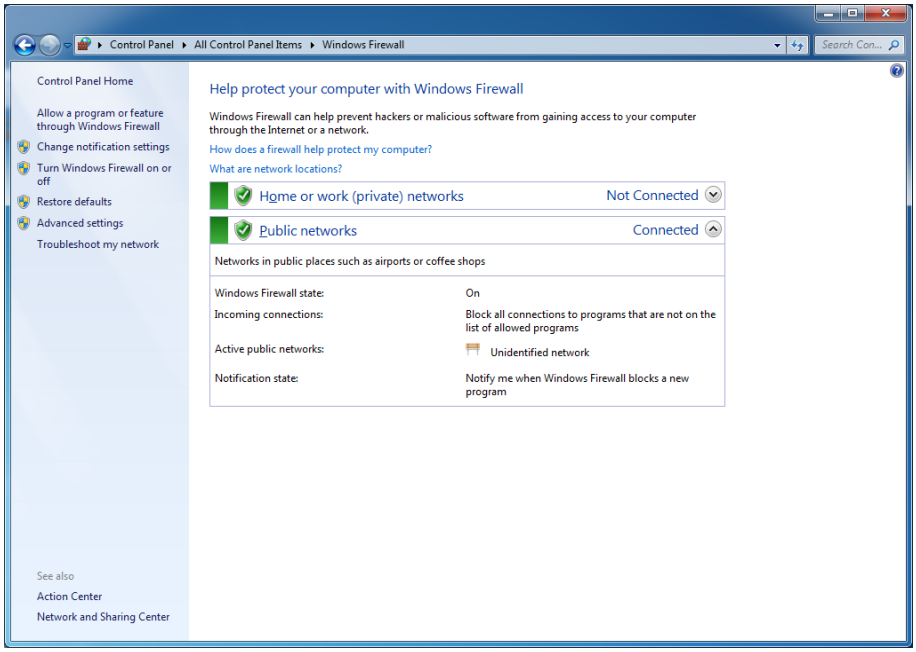
6 Check the **QXvue** to select and then click the **OK** button.



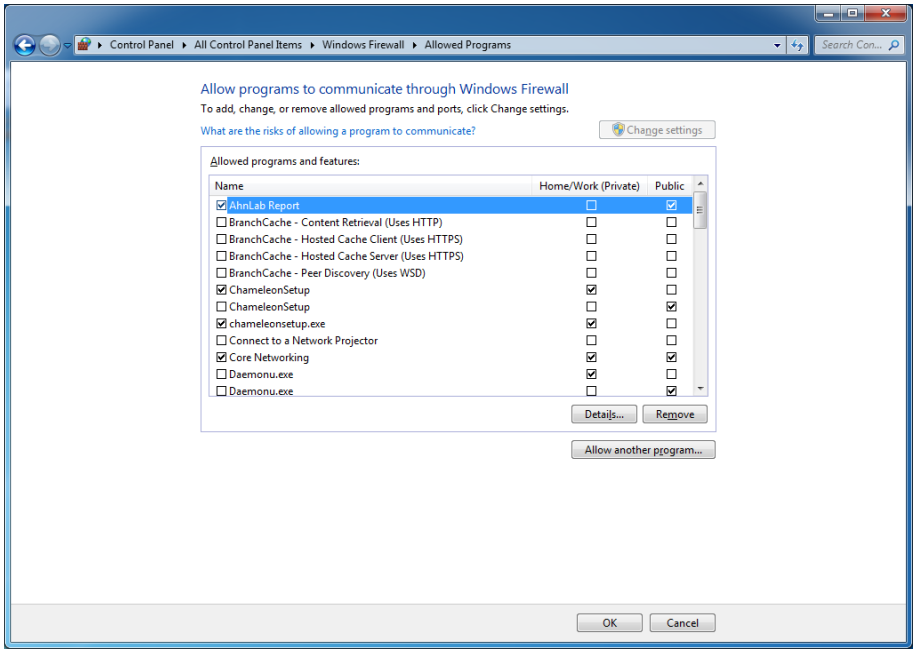
4.2.7 Allowing QXvue to communicate through Windows Firewall on Windows 7

1 Click **Start** > **Control Panel** > **Windows Firewall**.

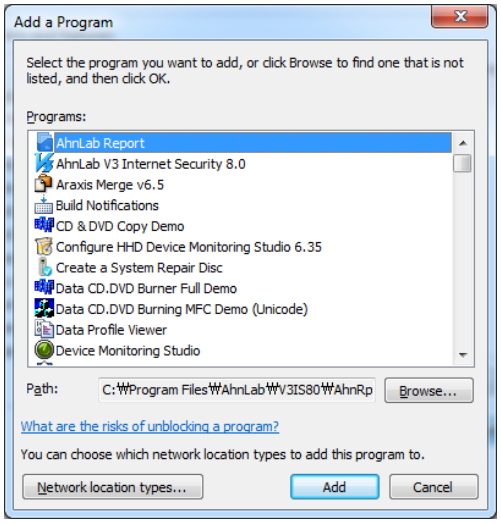
2 Click **Allow a program or feature through Windows Firewall**.


Control Panel ▸ All Control Panel Items ▸ Windows Firewall
Search Con...
Control Panel Home
Allow a program or feature through Windows Firewall
Change notification settings
Turn Windows Firewall on or off
Restore defaults
Advanced settings
Troubleshoot my network
Help protect your computer with Windows Firewall
Windows Firewall can help prevent hackers or malicious software from gaining access to your computer through the Internet or a network.
How does a firewall help protect my computer?
What are network locations?
Home or work (private) networks
Not Connected
Public networks
Connected
Networks in public places such as airports or coffee shops
Windows Firewall state:
On
Incoming connections:
Block all connections to programs that are not on the list of allowed programs
Active public networks:
Unidentified network
Notification state:
Notify me when Windows Firewall blocks a new program
See also
Action Center
Network and Sharing Center

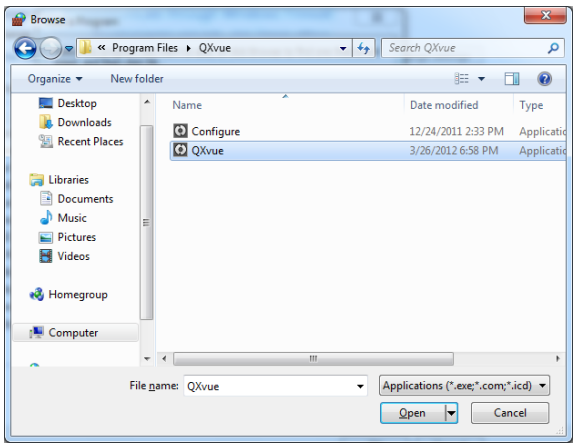
3 Click the **Change settings** button if it is enabled and then click the **Allow another program** button.



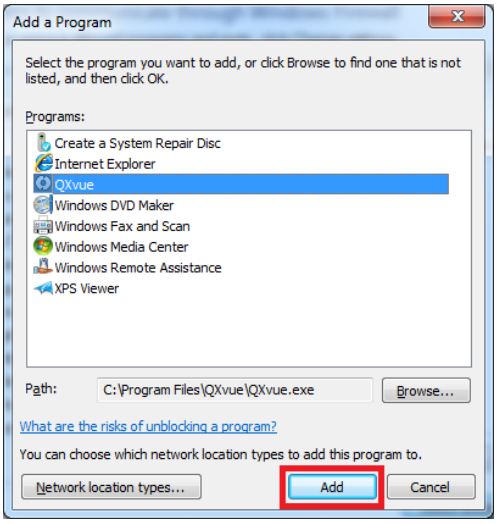
4 Click the **Browse** button and locate C:\Program files\QXvue\QXvue.exe.


Add a Program
Select the program you want to add, or click Browse to find one that is not listed, and then click OK.
Programs:
AhnLab Report
AhnLab V3 Internet Security 8.0
Araxis Merge v6.5
Build Notifications
CD & DVD Copy Demo
Configure HHD Device Monitoring Studio 6.35
Create a System Repair Disc
Data CD.DVD Burner Full Demo
Data CD.DVD Burning MFC Demo (Unicode)
Data Profile Viewer
Device Monitoring Studio
Path:
C:₩Program Files₩AhnLab₩V3IS80₩AhnRp
Browse...
What are the risks of unblocking a program?
You can choose which network location types to add this program to.
Network location types...
Add
Cancel

5 Click the **Open** button.



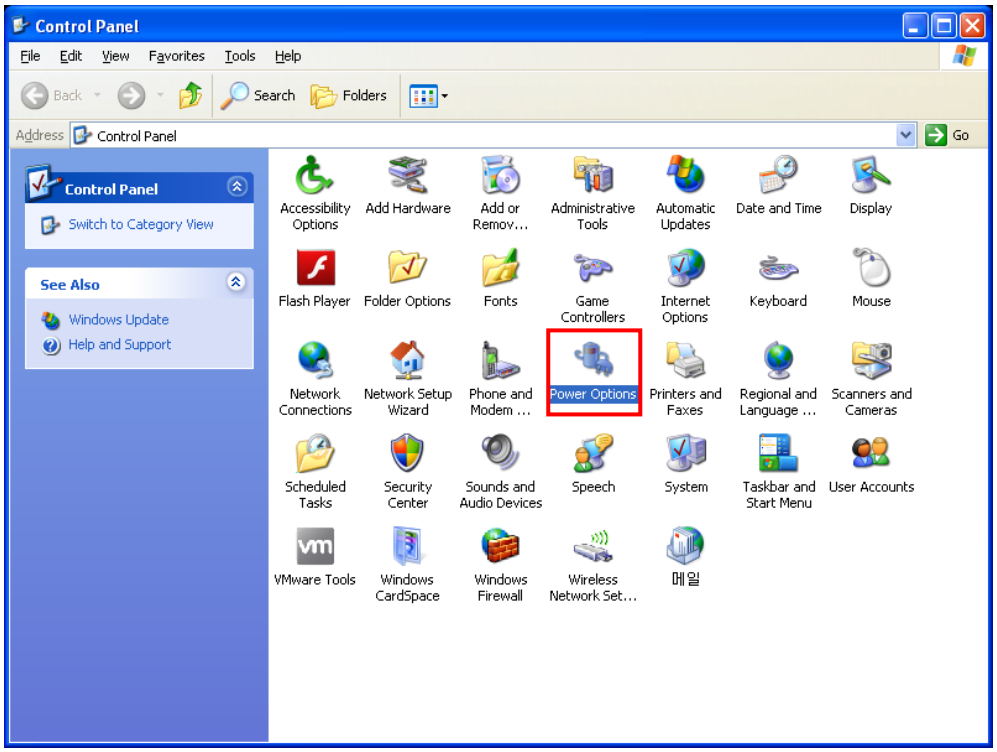
6 Select the **QXvue** and then click the **Add** button.


Add a Program
Select the program you want to add, or click Browse to find one that is not listed, and then click OK.
Programs:
Create a System Repair Disc
Internet Explorer
QXvue
Windows DVD Maker
Windows Fax and Scan
Windows Media Center
Windows Remote Assistance
XPS Viewer
Path:
C:\Program Files\QXvue\QXvue.exe
Browse...
What are the risks of unblocking a program?
You can choose which network location types to add this program to.
Network location types...
Add
Cancel

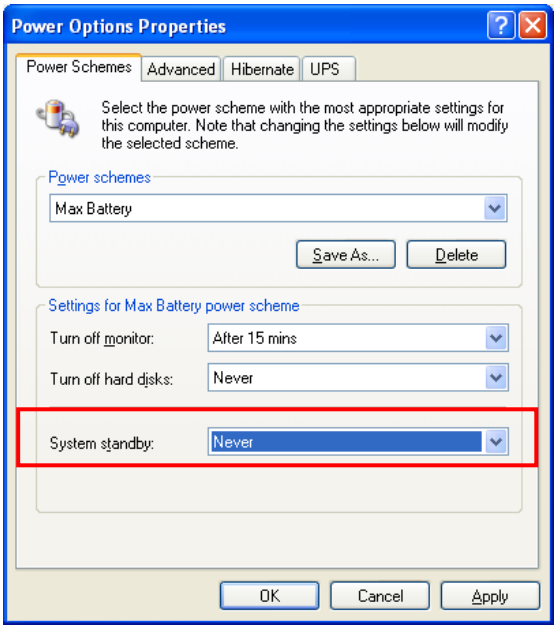
4.2.8 Disabling Standby Mode in Windows XP

	If you use standby mode in Windows XP, Viewer may not work normally.

1 Click **Start** > **Control Panel** > **Power Options**.



2 Click the **Power Schemes** tab and then select **Never** in **System standby**.

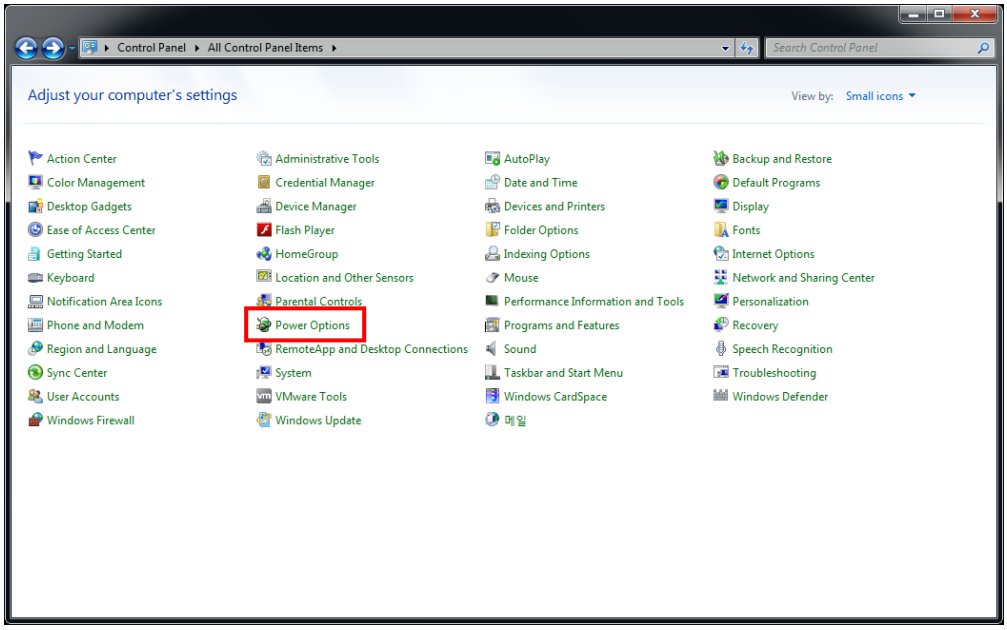


3 Click the **Apply** button.

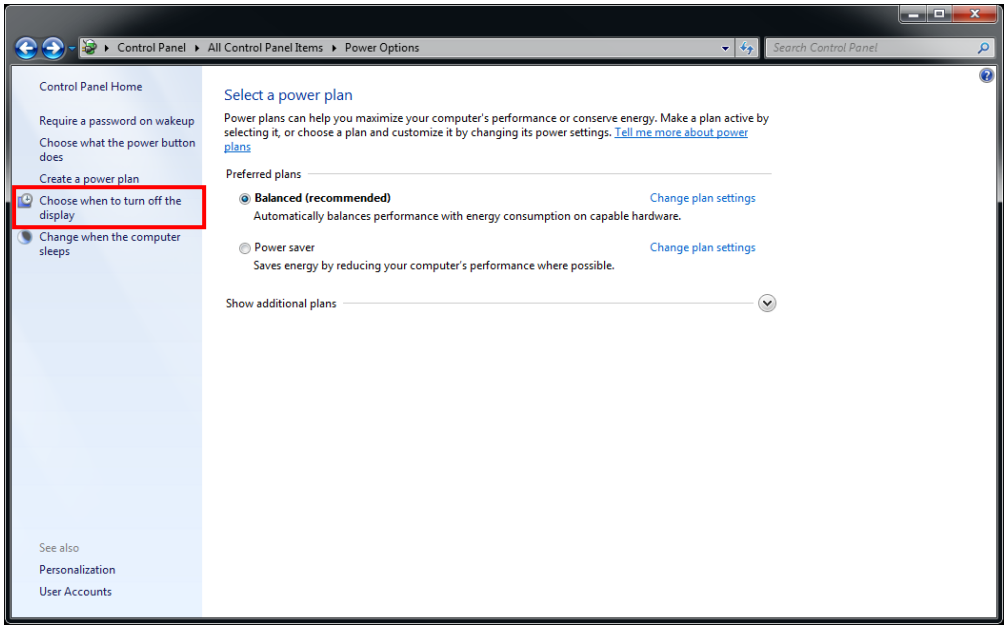
4.2.9 Disabling Sleep Mode in Windows 7

	If you use sleep mode in Windows 7, Viewer may not work normally.

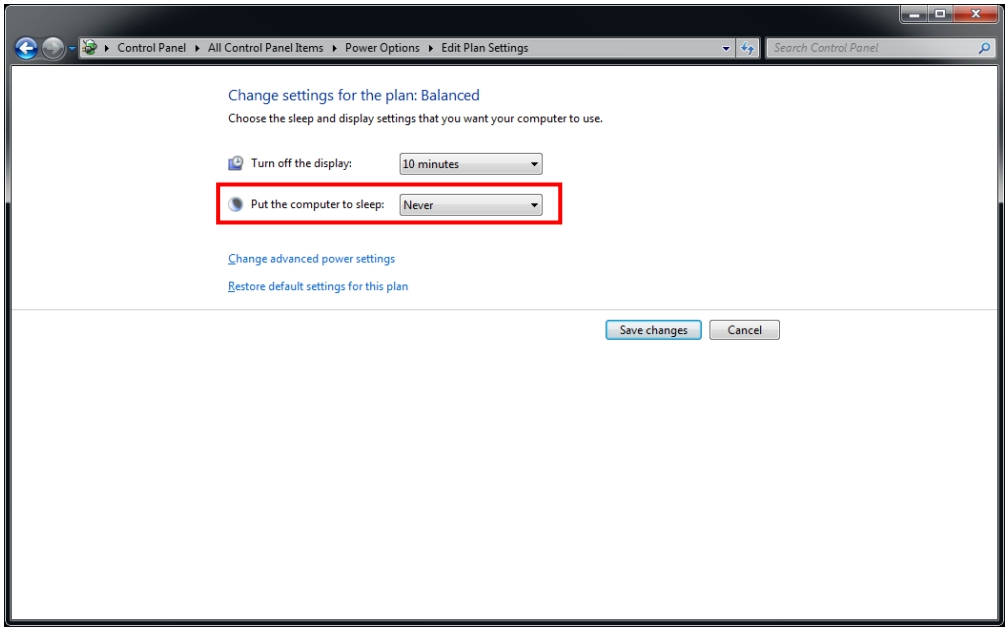
1 Click **Start** > **Control Panel** > **Power Options**.



2 Click the **Choose when to turn off the display** tab.


Control Panel ▸ All Control Panel Items ▸ Power Options
Search Control Panel
Control Panel Home
Require a password on wakeup
Choose what the power button does
Create a power plan
Choose when to turn off the display
Change when the computer sleeps
Select a power plan
Power plans can help you maximize your computer's performance or conserve energy. Make a plan active by selecting it, or choose a plan and customize it by changing its power settings. Tell me more about power plans
Preferred plans
Balanced (recommended)
Change plan settings
Automatically balances performance with energy consumption on capable hardware.
Power saver
Change plan settings
Saves energy by reducing your computer's performance where possible.
Show additional plans
See also
Personalization
User Accounts

3 Select **Never** in **Put the computer to sleep**.


Control Panel ▸ All Control Panel Items ▸ Power Options ▸ Edit Plan Settings
Search Control Panel
Change settings for the plan: Balanced
Choose the sleep and display settings that you want your computer to use.
Turn off the display:
10 minutes
Put the computer to sleep:
Never
Change advanced power settings
Restore default settings for this plan
Save changes
Cancel

4 Click the **Save changes** button.

5. Prerequisite for Operation

5.1 Preparing the PSU/SCU

1 Turn on the Power Supply Unit (PSU) or System Control Unit (SCU).

2 Make sure the LED lamp (power and status) is lit green. It means SCU is ready to work normally.

5.2 Detector Configuration

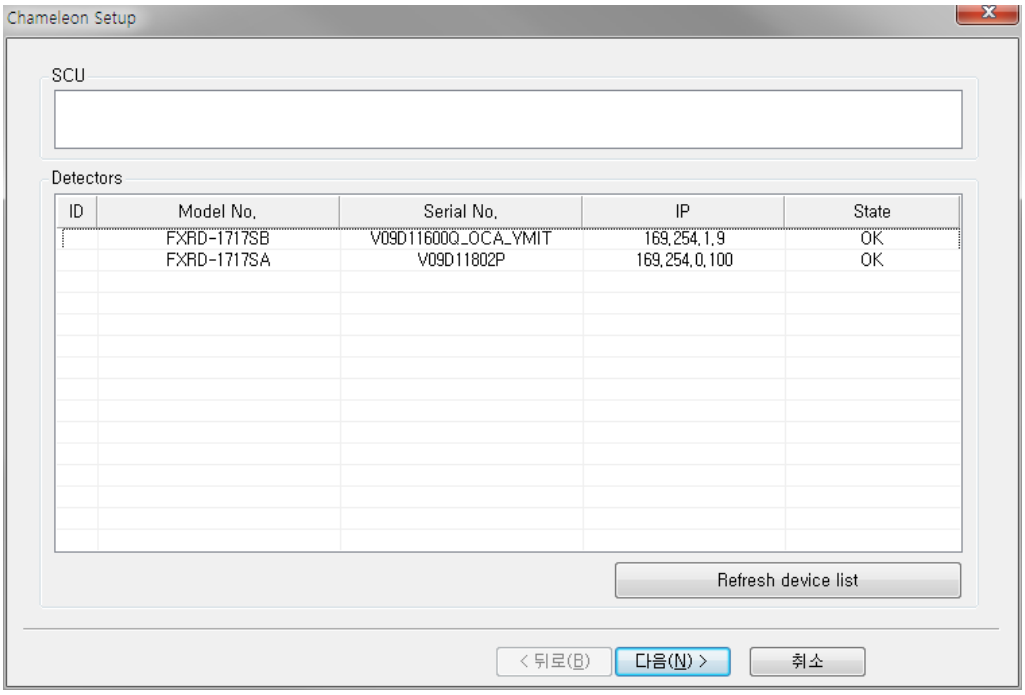
In this phase, defect pixels are corrected and gained pixels are calibrated using installed x-ray generator and x-ray tube. The detector needs to warm up at least 30 minutes before performing the calibration.

The calibration should be performed on the following cases.

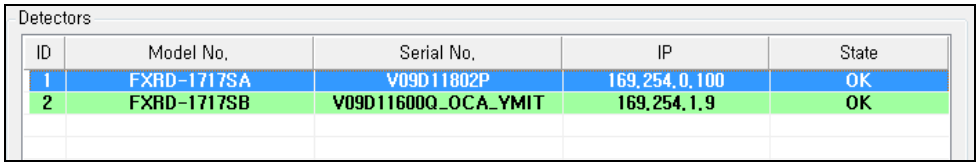
- Detector installation
- X-ray generator replacement
- X-ray tube replacement
- Exposure section Value change
- Gain Type change

5.2.1 Detector Setting

1 Run ChameleonSetup.



2 Select the detector in the **Detectors** list and double click it or click the **Next** button.



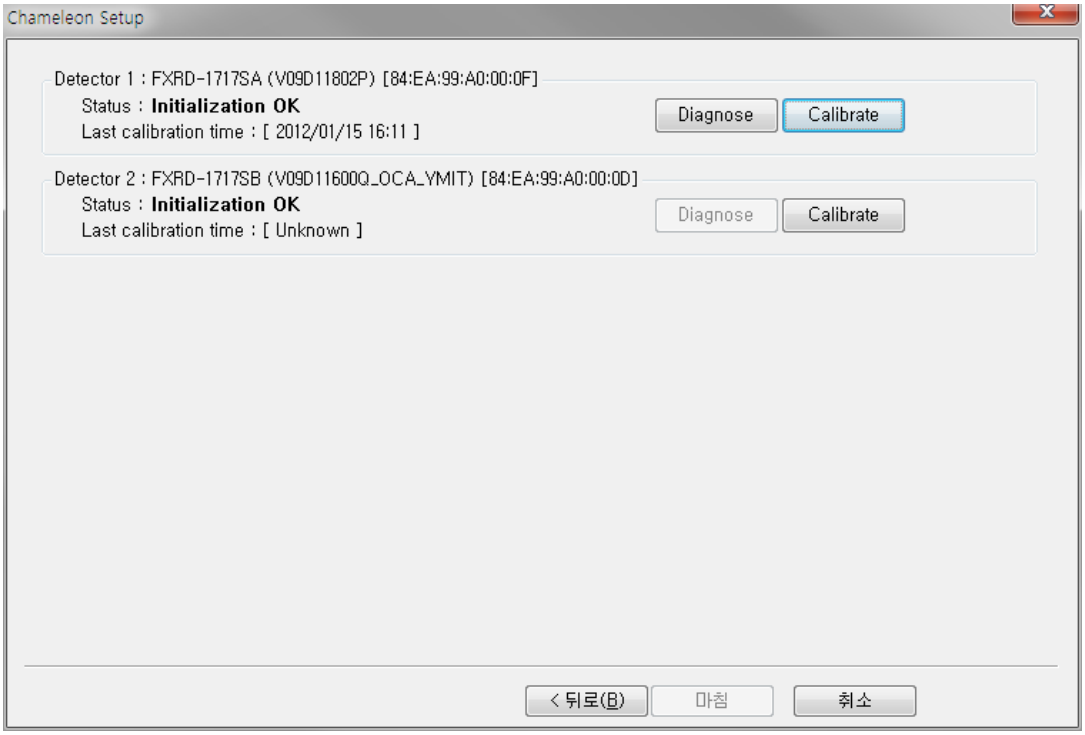
Status Indicator

- Green background: The detector is connected and selected normally.
- Black text on white background: The detector is connected but not selected.
- Gray text on white background: The detector is recorded on the usage history but not connected.

3 ID will be issued to the detectors according to the order of connections. To change the detector ID, select the detector and click the ↑ or ↓ buttons.

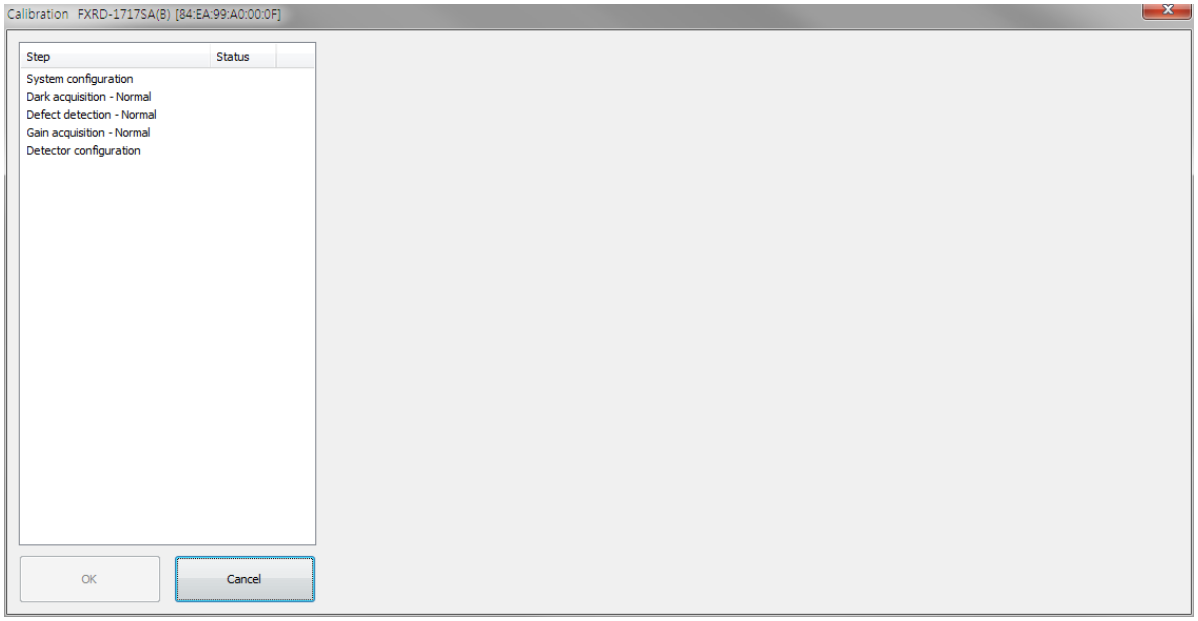
4 Click the **Next** button to proceed to the next step.

5 Click the **Calibrate** button to move on to System configuration.

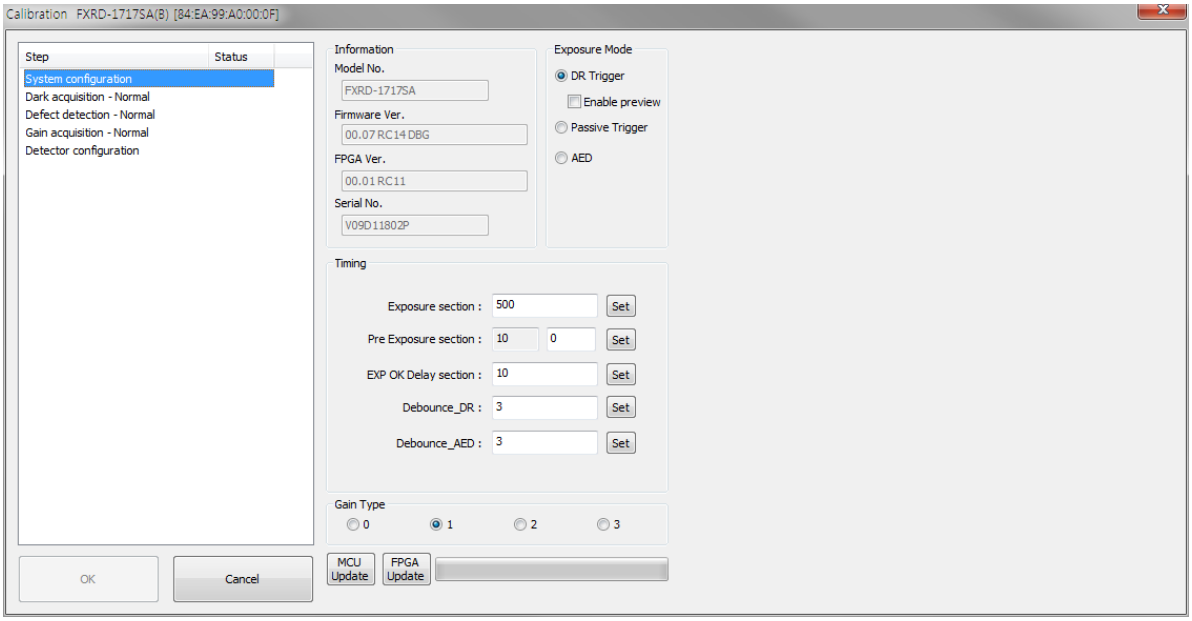


5.2.2 Configuring the Detector

1 Select **System Configuration** in the left Step item.



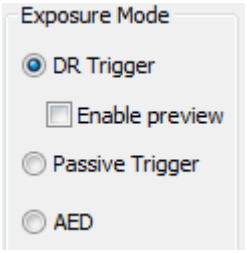
2 The information for the selected detector will be displayed.



5.2.2.1 Setting Exposure Mode

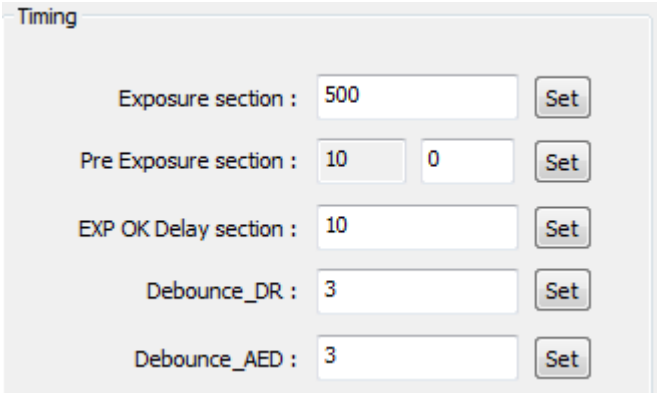
User can set the detector to three different exposure modes according to the connection type to the X-ray generator. Select the desired mode on **System configuration**.

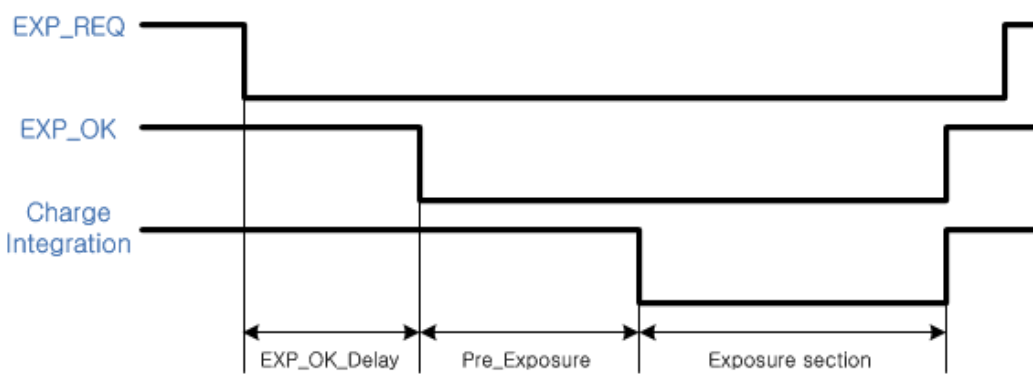
	For detailed information on X-ray exposure mode, refer to 2.4.1 X-ray Exposure Mode.



5.2.2.2 Timing Setting

To acquire correct images, exact timing setting must be made according to the characteristics of the X-ray generator.





Exposure section

Exposure section indicates the period (unit: ㎳) that the detector converts X-rays to image signals. This value needs to be set longer than the exposure time of X-ray generator to prevent X-rays loss while converting X-rays to image signals. If you change the time settings, refresh the Post-offset data and generate new GAIN data to acquire optimized images.

	The recommended Exposure section value is 500 ㎳ (Standard). Refer to chapter 5.3.1 Offset Calibration for more information about refreshing Post-offset.

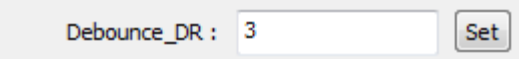
Pre Exposure section

The Pre Exposure section is allowed to use when delay is occurred until the generator receives EXP-OK signal from the detector and prepares X-ray generation. Pre Exposure section is set as 0 ㎳ normally, however, it is recommend to set the actual delay time of generator's X-ray generation with measurements to achieve the best performance of the detector. The detector sends EXP_OK signal to the generator, then transforms X-ray into image signal after the time set in the Pre Exposure section.

EXP OK Delay section

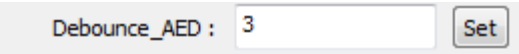
EXP OK Delay section is delay time from when the detector detects exposure request signal (EXP_REQ) from the X-ray generator to when the detector sends exposure respond signal (EXP_OK) to the X-ray generator. Some X-ray generators need some time to prepare detecting EXP_OK signal after sending EXP_REQ signal. This value is determined according to the specifications of X-ray generator. The default value is 1 ㎳.

Debounce_DR



Debounce_DR is used to remove unwanted trigger signal occurred due to external noise when DR Trigger is set as Exposure Mode. It is recommended to use the Debounce_DR setting value as default 3 ㎳. We recommend setting the minimum exposure time of X-ray generator to more than 3 ㎳. If the value is set to less than 3 ㎳, the detector may not acquire images.

Debounce_AED



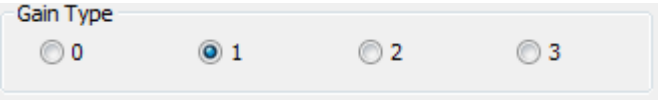
Debounce_AED is used to prevent unwanted imaging occurred due to external noise when AED is set as Exposure Mode. It is recommended to use the default values set by manufacturer.

Model	Default Value
FXRD-1717SA/B	3 ㎳
FXRD-1417SA/B	5 ㎳

We recommend setting the minimum exposure time of X-ray generator to more than the value set in the Debounce_AED. If the value is set to less than the settings in the Debounce_AED, the detector may not acquire images.
If unwanted images are acquired without X-ray exposure while operating the equipment, set Debounce_AED with 1 ㎳ increments. However, make sure not to exceed 7 ㎳ since an image degradation may appear in the image if Debounce AED exceeds 7 ㎳. If it exceeds 7 ㎳, an image is not acquired or image degradation may occur.

	If you set Debounce_AED to less than 5 in FXRD-1417SA/B, an image which does not contain any image information can be acquired without having to expose X-rays.

5.2.2.3 Gain Type Setting



To acquire X-ray image with proper brightness, adjust the Gain Type setting. You can select the Gain Type to adjust the sensitivity of the detector, then you can acquire X-ray images with desired brightness according to the specifications of X-ray generator or the type of objects. The default gain type is 1.

The following table describes each Gain Type of the sensitivity ratio.

Gain Type		0	1	2	3
Gadox Detector	Sensitivity ratio	0.86	**1**	1.2	1.5
CsI Detector	Sensitivity ratio	0.62	**1**	1.14	1.33

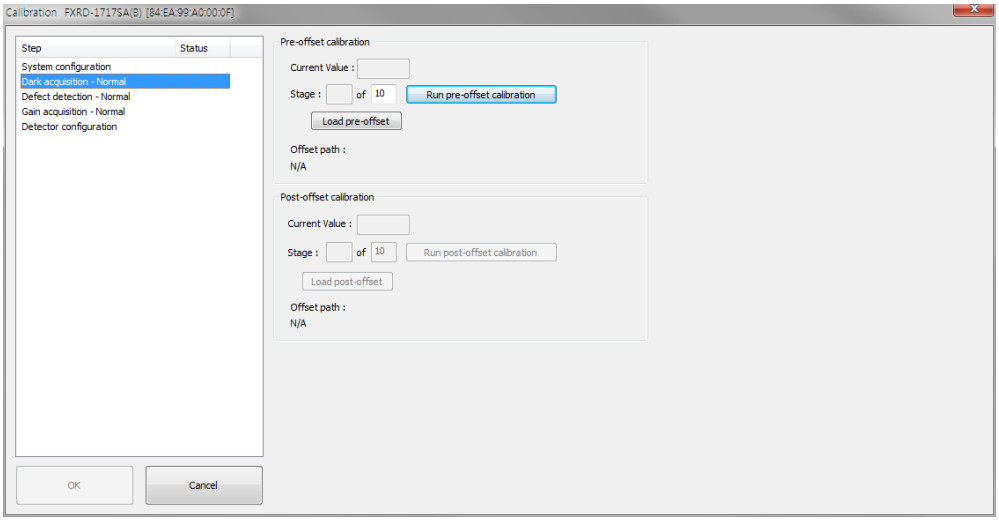
CAUTION	The owner is responsible for ensuring that the Gain Pixel Correction is performed after adjusting the Gain Type.

5.3 Calibration

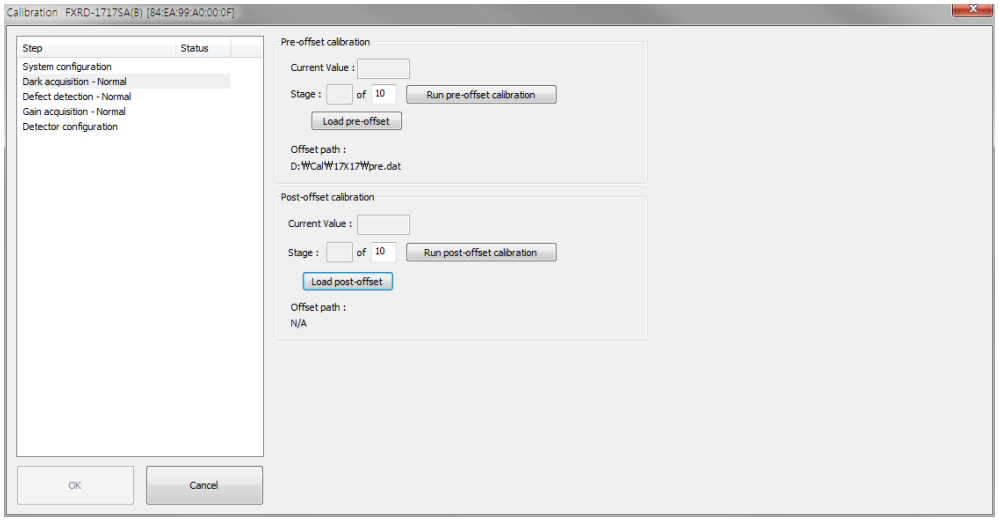
	To restore the default settings, you must use the calibration data included on the CD which is provided with the detector.

5.3.1 Offset Calibration

1 Select **Dark acquisition–Normal** and click the **Load pre-offset** button to apply pre-offset data which is provided with the flat panel detector.

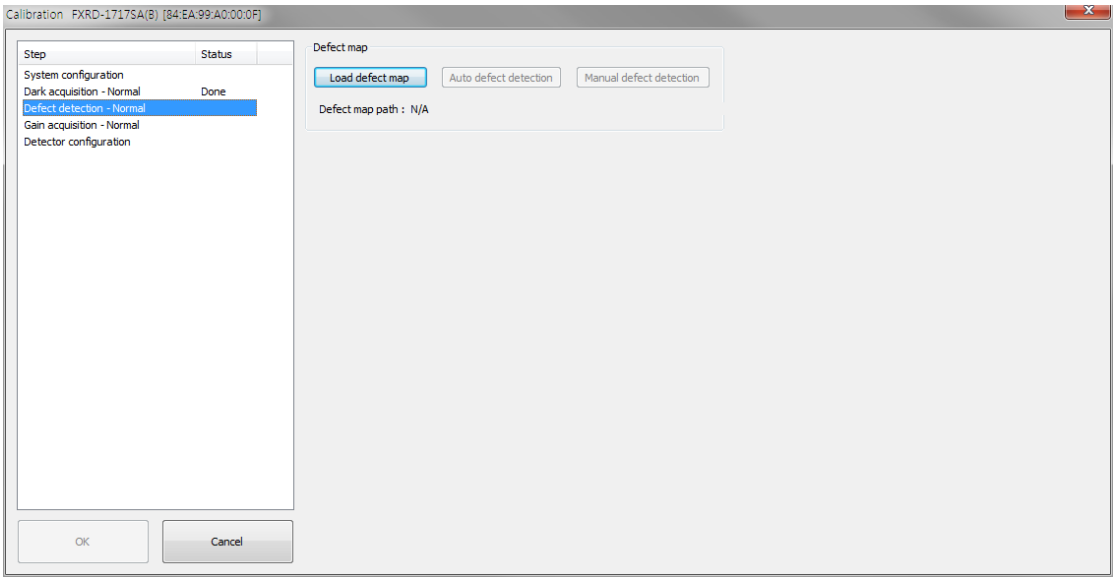


2 Click the **Load post-offset** button to apply post-offset data which is provided with the flat panel detector. To refresh or generate the Post-offset, click the **Run post-offset calibration** button. Post-offset will be acquired automatically. If the number in the Stage increases and becomes to ten, the Save As window will be activated, then you can save the Post-offset data.



5.3.2 Defect Correction

1 Select the **Defect detection-Normal** in the left Step item.



2 Click the **Load defect map** button to apply the defect data which is provided with the flat panel detector.

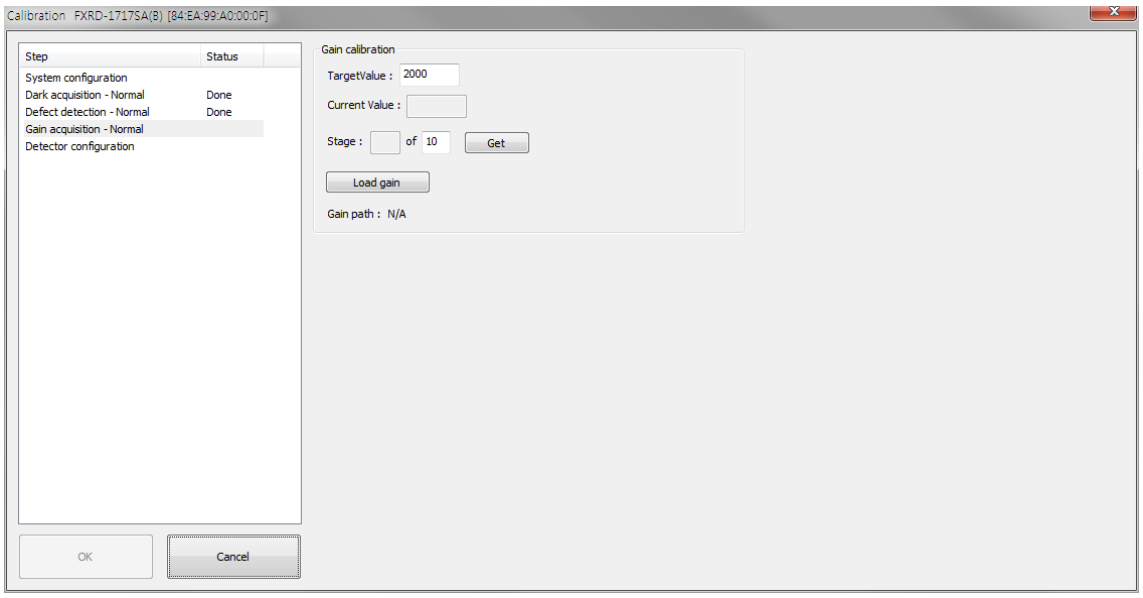
5.3.3 Gain Pixel Correction

Before performing Gain Pixel Correction, consider followings:

- Recommended SID is 150 cm (distance between X-ray tube and Detector).
- Open the collimator of X-ray tube completely.
- Align the center of the detector with the center of collimator.
- Keep everything away from the detector surface.

1 Select **Gain acquisition – Normal** in the left Step item. Expose X-rays and adjust dose of X-rays so that Current Value reaches TargetValue. Keep the quantity of X-rays when Current Value remains within 10% difference of TargetValue.

	Recommended TargetValue is 2000.



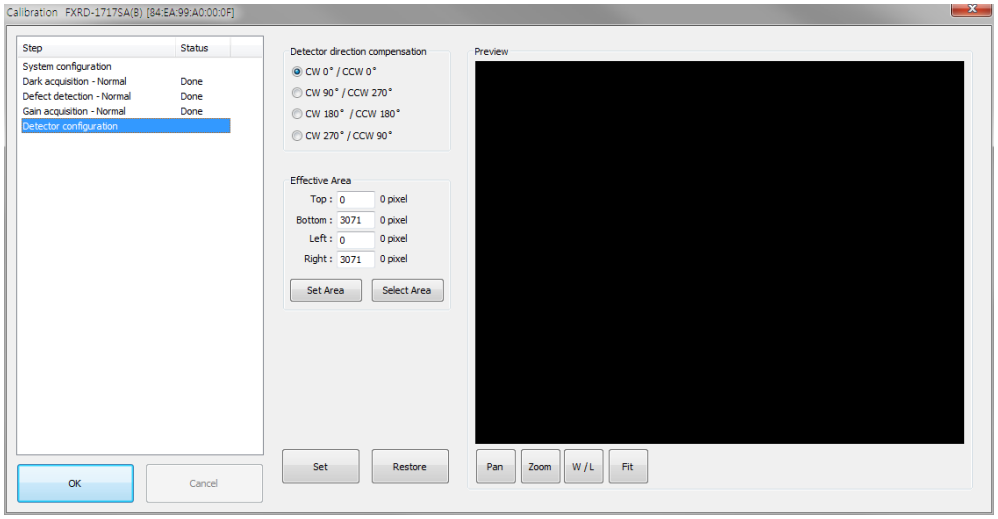
2 Click the **Get** button and expose X-rays ten times.

3 If ten images are acquired, save the Gain data to the desired folder.

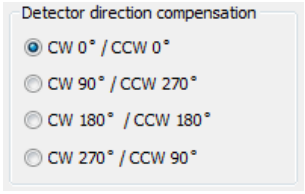
4 Once all the procedures are completed, the **OK** button will be activated. Click the **OK** button to close the dialog box.

5.3.4 Detector Configuration

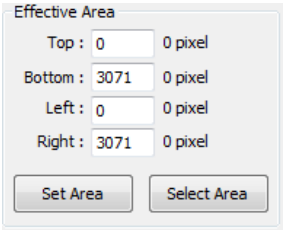
1 Select **Detector configuration** in the left Step item.



2 Select the rotation angle of the detector in the **Detector direction compensation** options. The rotation angle does not affect the images acquired with ChameleonSetup.



3 To activate regions of interest in the detecting area, click the **Set Area** button in the Effective Area item and then specify the desired area in the Preview window. Or, input the Top, Bottom, Left and Right value and click the **Set Area** button to apply the area.



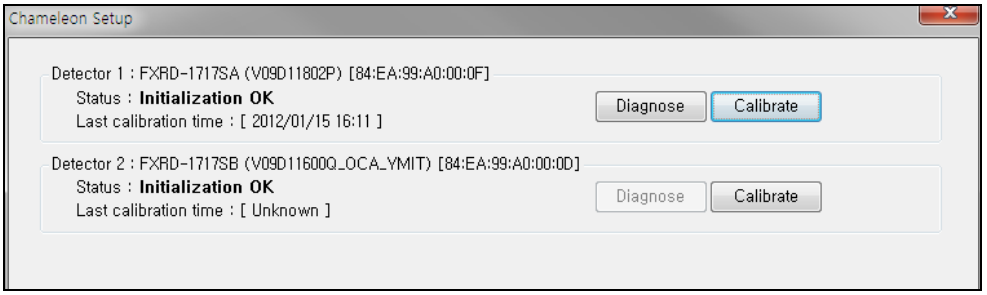
	If you do not acquire a test images after setting the Effective Area, the function will not work.

4 After completing the configuration, click the **Set** button to save the settings. To cancel the settings before saving it, click the **Restore** button.

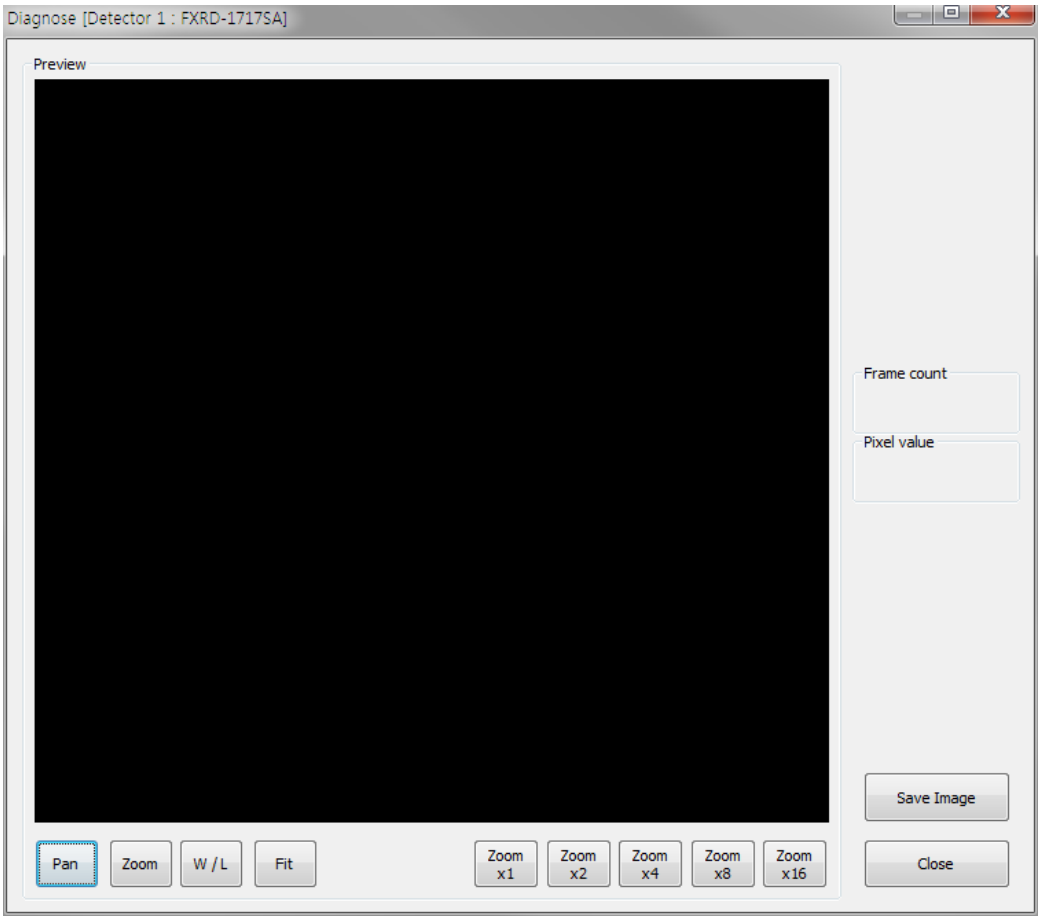
5.4 Diagnosis

	The **Diagnose** button will not activated until completing the calibration.

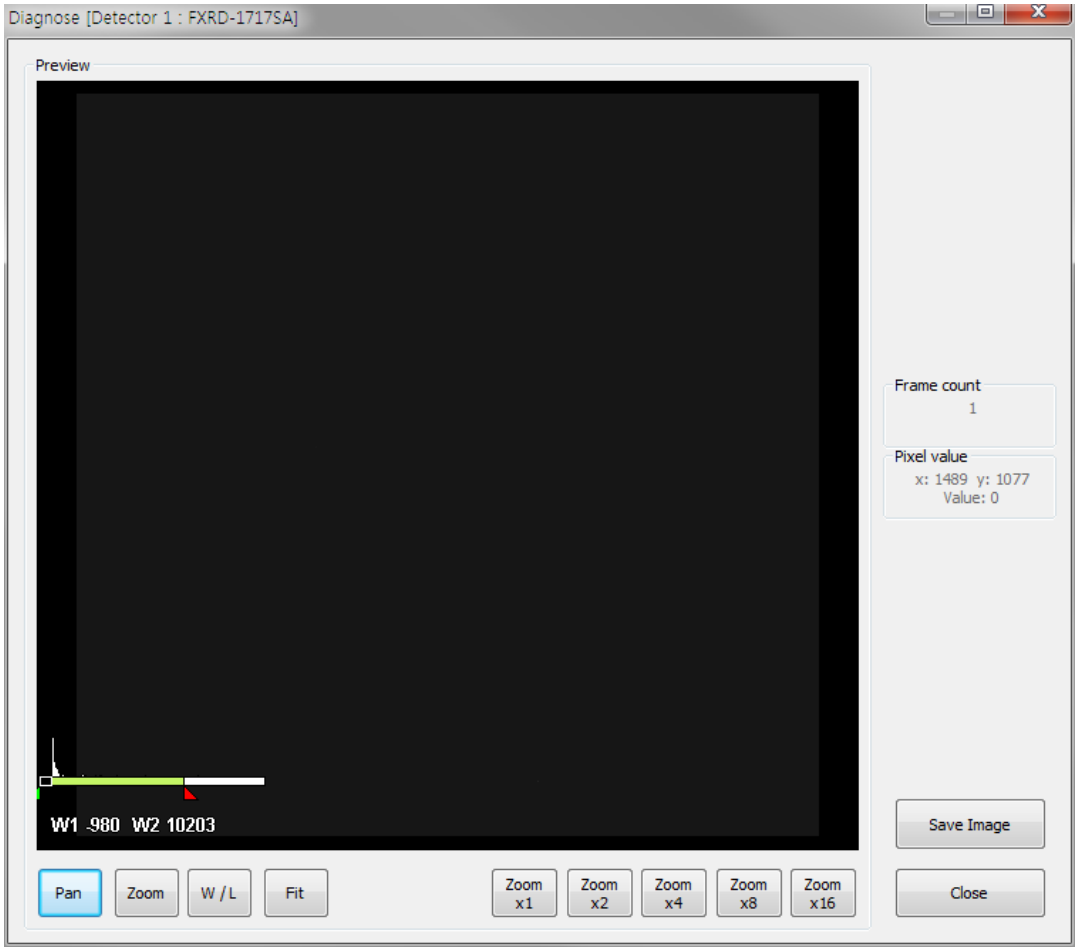
1 Click the **OK** button in the calibration window to close the configuration window and return to previous step.



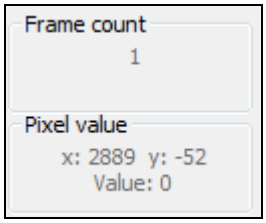
2 Click the **Diagnose** button to move to system diagnostic step.



3 When you perform image acquiring, the image will be displayed in the Preview window.



4 The number of acquired images will be displayed in the **Frame count**, and the current mouse position in pixel coordinates and the pixel value will be displayed at the bottom.



5 Click the **Save Image** button at the bottom right to save the acquired images.

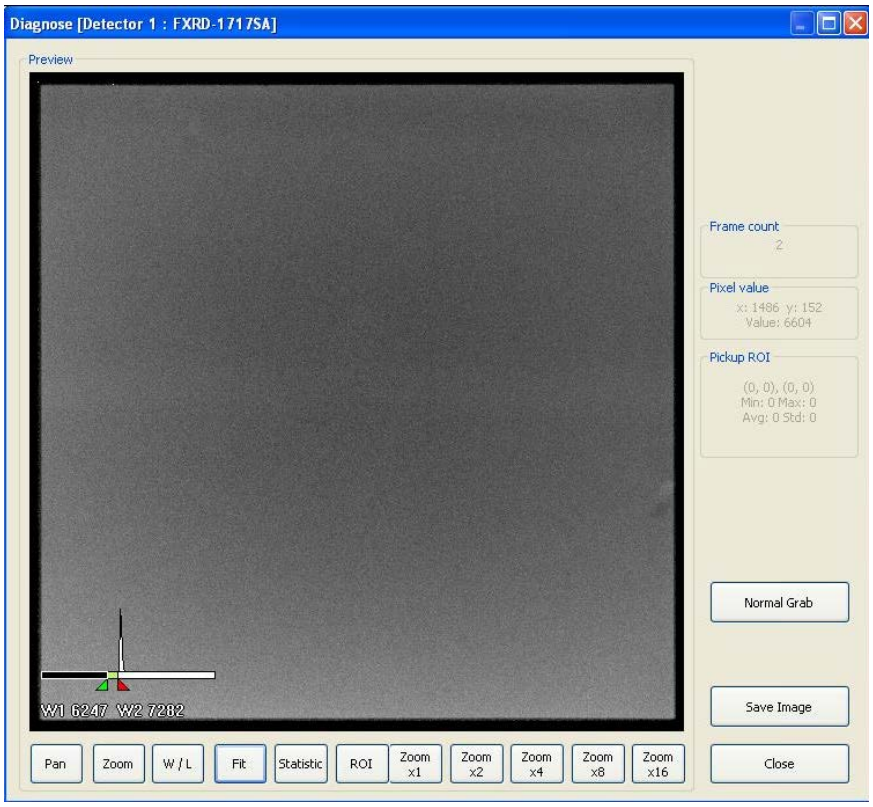
5.5 Manual Defect Calibration

	While operating the detector, defect pixels may appear on the image. Manual Defect Detection provides the feature which calibrates defect pixels.

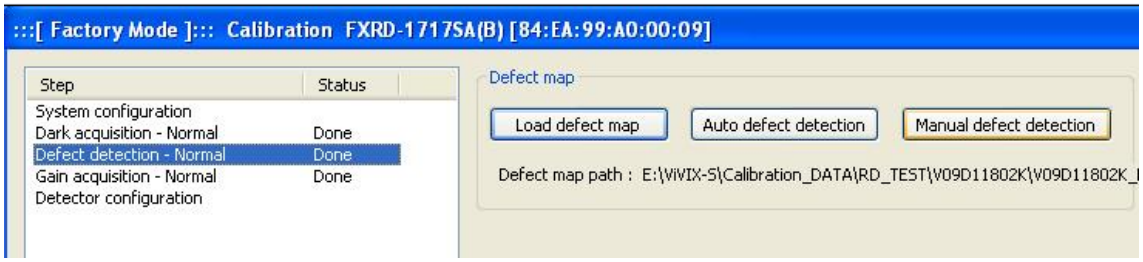
1 To perform Manual Defect Calibration, acquire X-ray FLAT image of the detector in which defect pixels are appeared.

	The FLAT image can be acquired under the following conditions. • It is recommended to warm up the detector at least 30 minutes. • Recommend SID is 150 ㎝ (distance between X-ray tube and detector). • Open the collimator of X-ray tube completely. • Align the center of the detector with the center of collimator. • Keep everything away from the detector surface. • Recommended X-ray Dose is 80KV, 4mAs (100 ㎃, 40 ㎳).

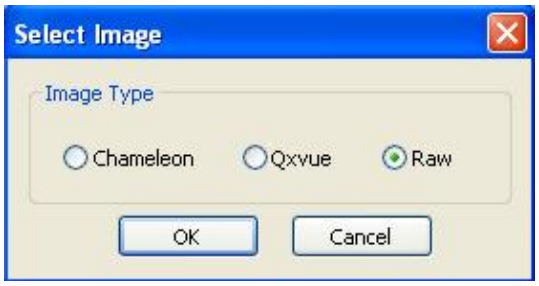
2 Click the **Save Image** button in the Diagnose to save the acquired images to the designated folder.



3 Click the **Manual defect detection** button in the **Defect detection-Normal** menu.

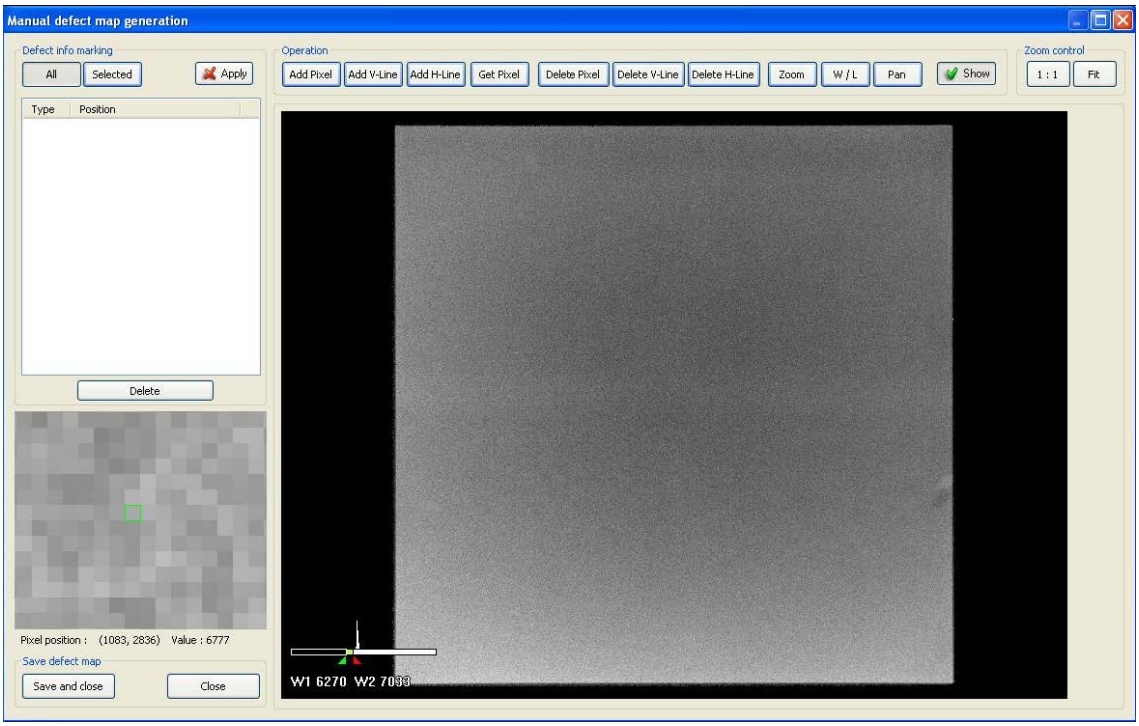


4 Select **Raw** and click the **OK** button.



5 The **Manual defect map generation** menu will be activated.

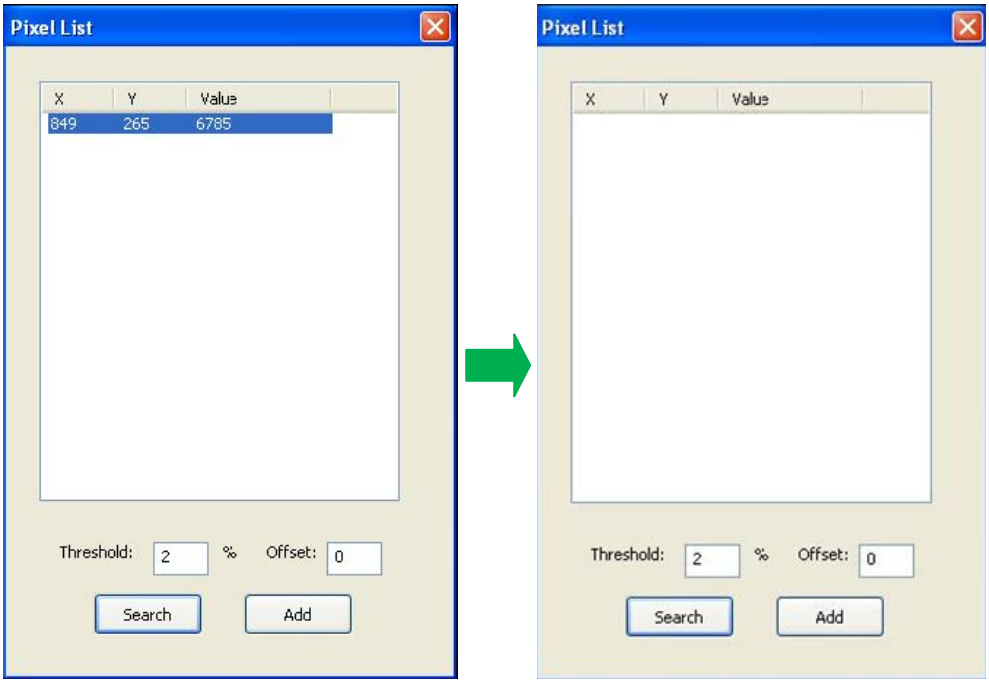
Click the **Apply** button in the top left and then click the **Get Pixel** button.



	5 - 10 procedures use **Get Pixel** feature to detect defect pixels automatically.

6 Input into the Pixel List menu as follows.

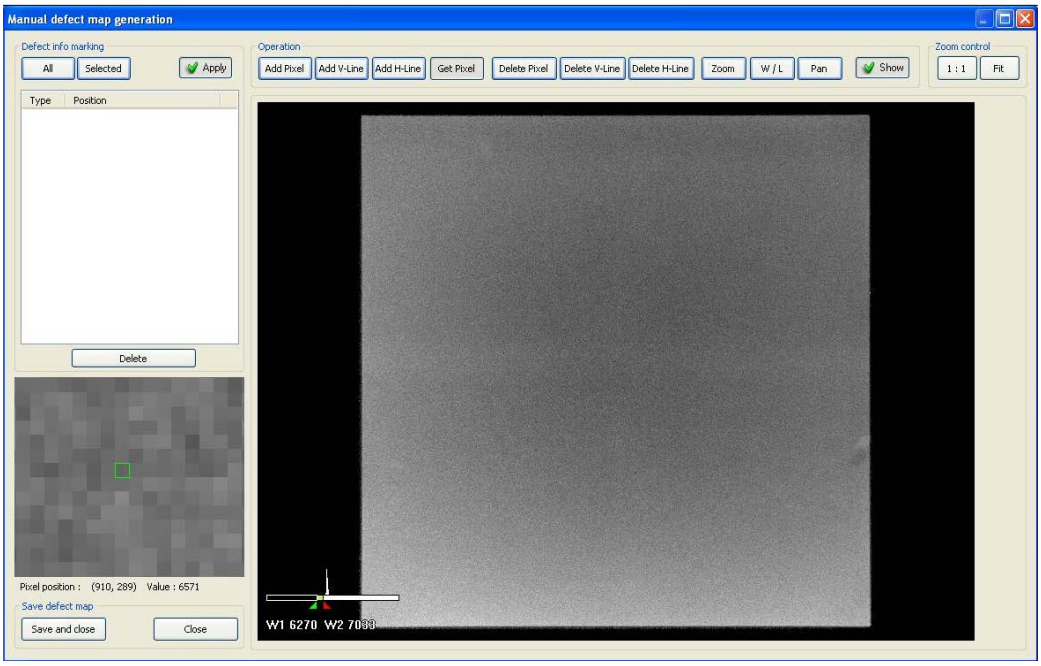
- Threshold: 3
- Offset: 0



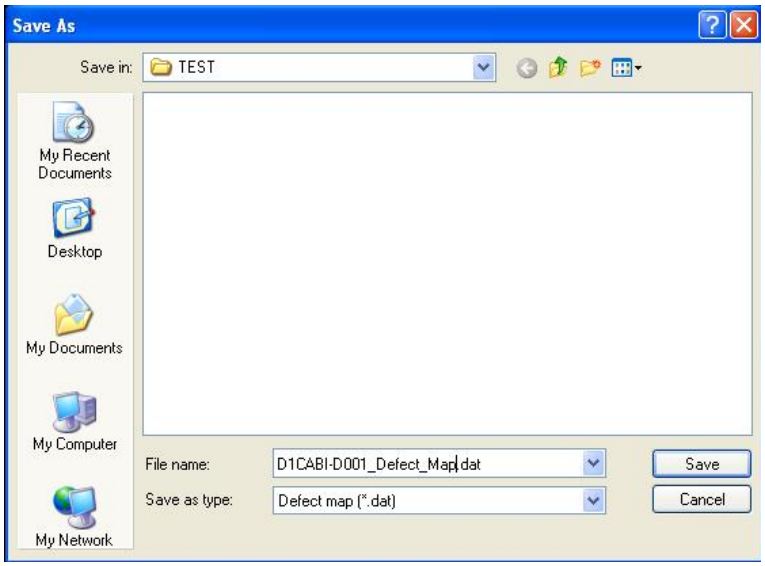
7 Click the **Search** button in the bottom to detect defect pixels in the FLAT image and display the coordinates of defect pixels and Gray level values in the list.

8 While pressing the **Ctrl** key, select the coordinate of detected defect pixel in the **Pixel List** and then click the **Add** button to add it to Defect Map List.

9 In the **Manual defect generation** menu, click the **Save and Close** button located in the bottom left.



10 Save the newly generated Defect Map DATA to the folder where the Calibration Data is stored.



	• It is recommend saving the newly generated Defect Map DATA with different name to preserve the original Defect Map DATA. • 11 – 16 procedures describe how to detect defect pixels manually.

11 In the **Manual defect map generation** menu, click the **Apply** button.

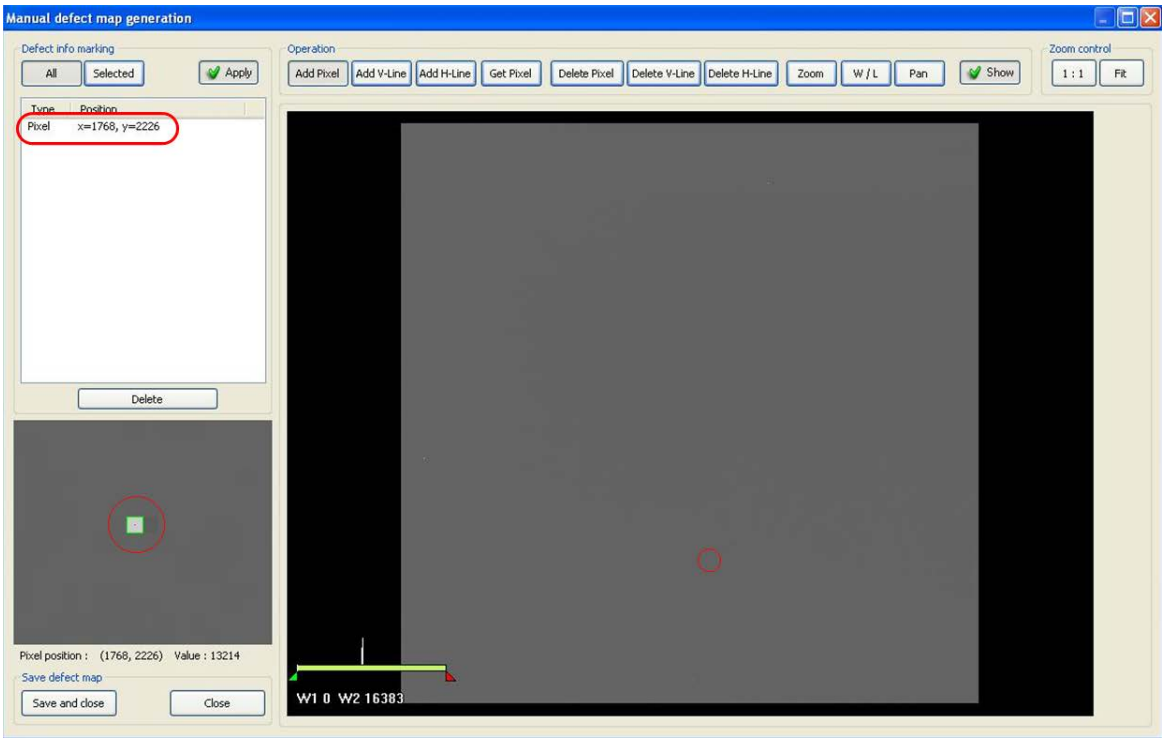
12 While clicking the right mouse button in the FLAT image, move it to left, right, top or bottom to adjust the brightness until you can verify the image with naked eye.

13 Use the Zoom or Pan features properly to move to the location of defect pixel.

14 Click the **Add Pixel** button.

	• A window located in the bottom left will magnify and display the pixel where the mouse pointer is located. The coordinate and Gray level value of the pixel will be displayed under the window. • If a selected pixel has difference in the brightness or gray level value (more than 3%) compared to the adjacent pixels, the pixel may be regarded as a defect pixel.

15 If you click the mouse left button on the point regarded as a defect pixel, it will displayed in red and the coordinate of the pixel will be added to the top left window.



16 In the **Manual defect map generation** menu, click the **Save and Close** button to save Defect Map DATA with new name.

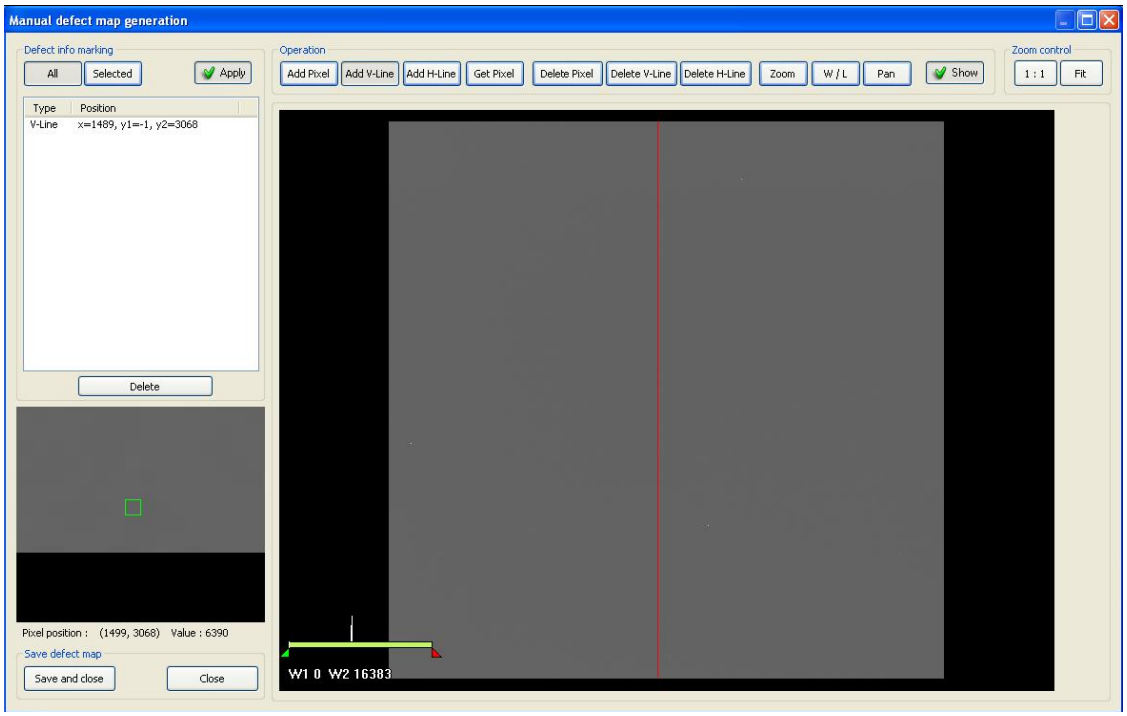
	17 – 20 procedures describe how to calibrate line type defect pixels in the Manual defect map generation menu.

17 Locate and move to the start point of line type defect pixels in the image.

18 Click the **Add V-Line** button.

19 Click the mouse left button on the first pixel of line defect pixels, move the mouse to opposite direction while holding the mouse button, then release the mouse button on the last pixel. A red line will be displayed on the image and defect pixels on the line will be added to Defect map list.

20 In the **Manual defect generation** menu, click the **Save and Close** button to save Defect Map DATA with new name.



	• You can also calibrate the defect pixels appeared as horizontal line. • Defect Pixel Calibration can be performed in pixel unit and line unit and then can be saved in Defect Map List together.

Manual defect map generation

The features in the Manual defect map generation menu are as follows.

- Apply: Determine whether to apply Defect information in the list to the image.
  - All: Apply all coordinates of defect pixels added to the list to the image.
  - Selected: Apply only corresponding coordinates to the selected defect pixels on the list to the image.
- Delete: Delete the selected items from the list.
- Add Pixel: Add one pixel unit of defect pixel to Defect Map List.
- Add V-Line: Add line type of defect pixels vertically to Defect Map List.
- Add H-Line: Add line type of defect pixels horizontally to Defect Map List.
- Delete Pixel: Delete one pixel unit of defect pixel from Defect Map List.
- Delete V-Line: Delete line type of defect pixels vertically from Defect Map List.
- Delete H-Line: Delete line type of defect pixels horizontally from Defect Map List.
- Zoom: Zoom in or out the image.
- W/L: Adjust the window level of the image to change the brightness.
- Pan: Move the image to desired location.
- Show: Determine whether to display the selected defect pixel on the image.
- 1:1: Display the image at one to one ration.
- Fit: Display the image to fit into the screen.

5.6 QXvue Configuration

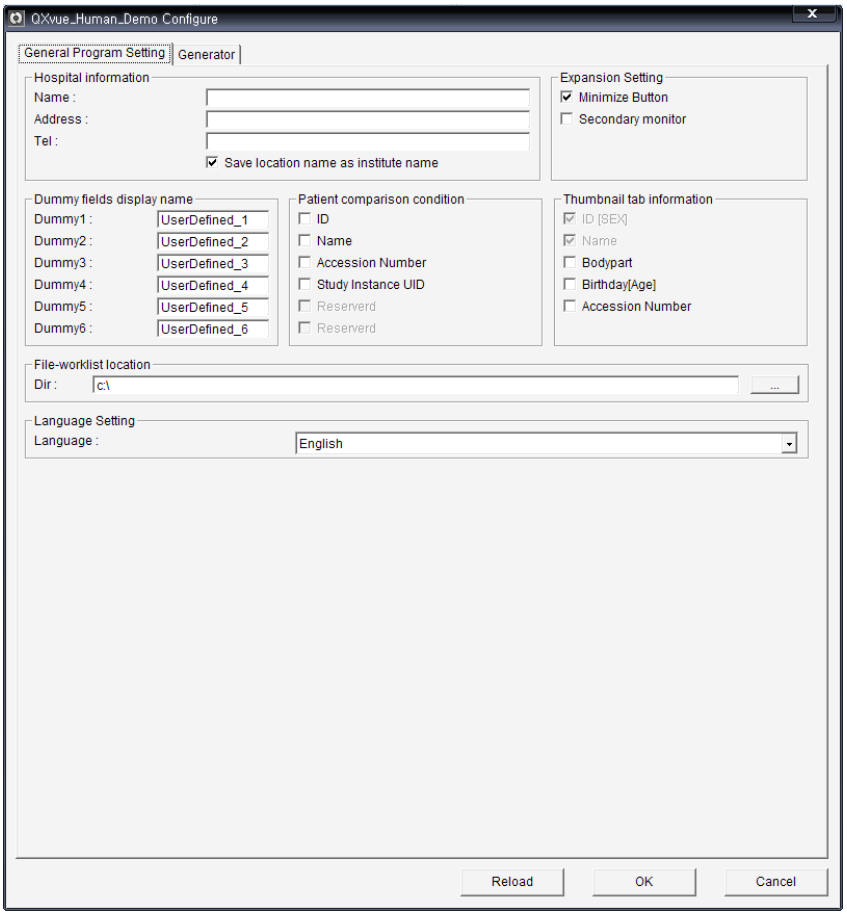
User can set the various parameters that are used in the QXvue by using configuration software, so the proper setting of parameter is important.
Configuration of QXvue is needed when the VIVIX-S is installed, and this is prerequisite for using QXvue.

Configuration of QXvue consists of two parts;

- General program setting and Generator setting by Configure: Basic information used by QXvue
- DICOM parameter setting by QXvueConfigure_DICOM: Worklist related DICOM header setting

The configuration software is located at “C:\program files\QXvue” folder.

5.6.1 General Program Setting



- Hospital information
  - Input the name, address and telephone number of the hospital in which the VIVIX-S system is installed.
  - The values of the name field and address field are put into the **institution name** tag and **institution address** tag respectively when creating DCM files.

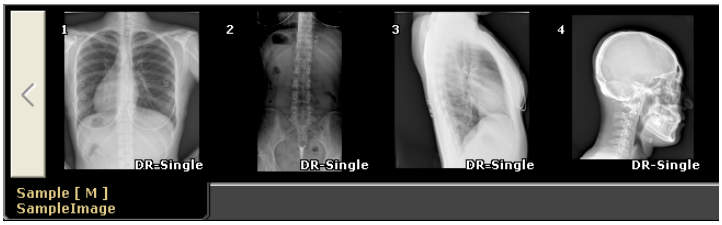
- Expansion setting

  - If the **Minimize Button** check box is selected, you will have the Minimize button above the **Exit** button.

- Dummy fields display name
  - Dummy field is used for the connection with the worklist server.
  - If the worklist server sends some information that is not mentioned in the DICOM standard, then QXvue can receive that information using dummy fields.
  - Dummy field will be displayed as the name which is set in the order list.

- Patient comparison condition
  - QXvue distinguishes among patients by comparing the selected fields of patients when registering the patients from the worklist server into the local patient list database.
  - When the user queries study order from the worklist server, if all selected patient comparison field data is equal to already registered order, QXvue ignores that study order.
  - If none of comparison field is selected, then Patient ID will be used as comparison field.
  - If any comparison field is selected, only the selected field will be used as comparison field.

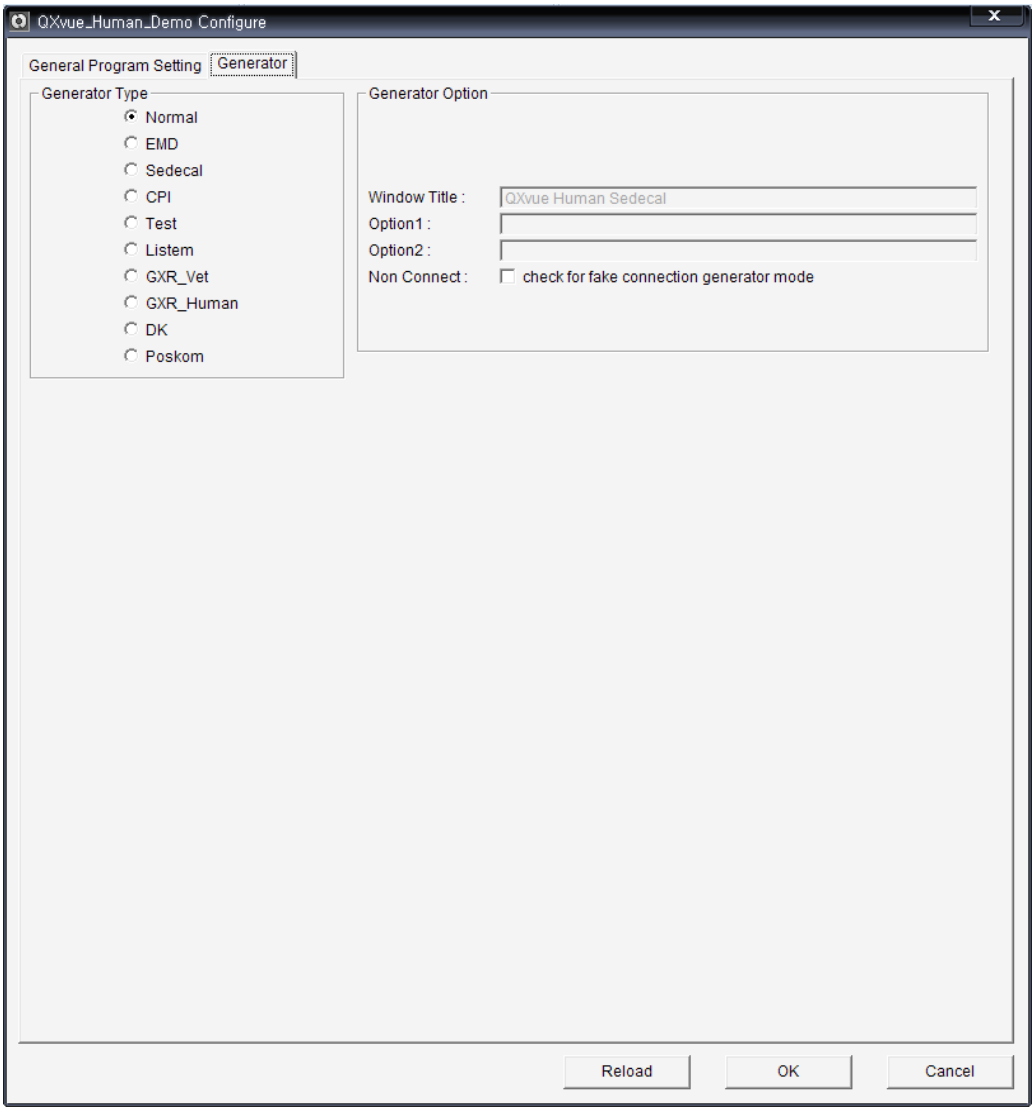
- Thumbnail tab information



  - Select the item(s) to be displayed in the thumbnail tab.
  - Patient ID and name is default and the additional information can be displayed in the thumbnail tab according to the setting.

- File-worklist location
  - If worklist server is not available and the PACS system is providing order using text file, QXvue can receive patients list from that file.
  - If there is new order file in the assigned folder, QXvue will load study order from that file, and then delete it after loading.

5.6.2 Setting Generator Type and Options



Generator type

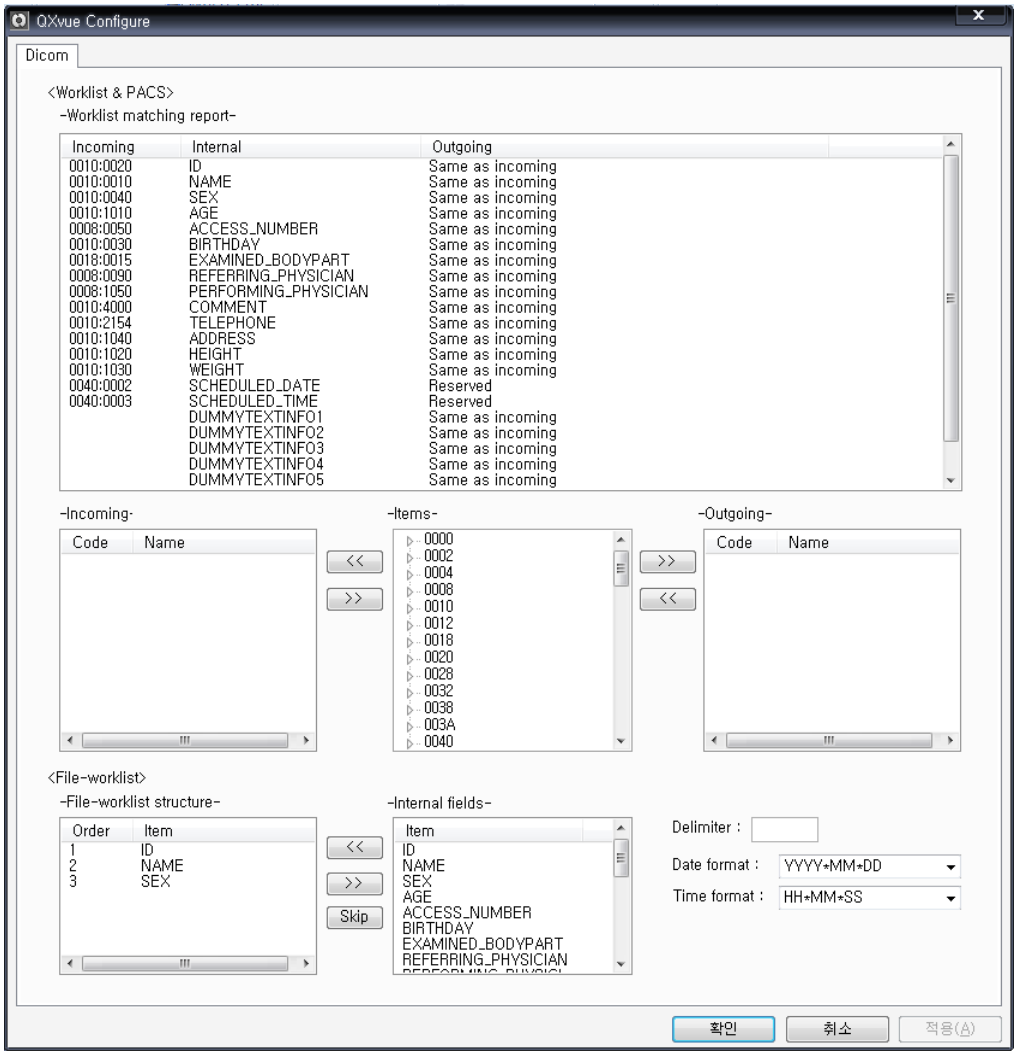
Type	Generator	Communication	Setting	Etc.
0	Normal			No console
1	EMD	Serial	Port COM 3 / 19200 bps / data 8 / stop 1 / none / none	Set WorkStation 2, 3
2	SEDECAL	Shared memory	Window title: ‘window title’	For Human in DRApp.ini [SETTINGS] DRAppName = window title For Vet in AppName.ini [CONFIG] APPNAME= window title
3	CPI	Serial	Port COM 1 / 19200 bps / data 8 / stop 2 / none / none	
4	TEST			For test
5	LISTEM	Serial	OPTION_1: Port OPTION_2 :’true’ - Use AEC ‘false’ - No AEC 115200 bps / data 8 / stop 1 / none / none	
6	GXR_Vet	UDP packet	UDP 5001 Port	
7	GXR_Human	UDP packet	UDP 5001 Port	
8	DK (Accuray)	Serial	Port COM 1 / 19200 bps / data 8 / stop 1 / none / none	OCX Control

Generator Option

This option should be set according to each generator model.

WARNING	This console function on QXvue can be changed without a notice according to protocol of generator.

5.6.3 DICOM Parameter Setting



QXvue uses internally defined tag name related to patient information for DICOM compatibility. This information will be filled when the user registers a patient or QXvue receives study order from the worklist server.

After X-ray exposure, these information will be stored to the internal database and will be put to the DICOM file as DICOM tag when the user makes DICOM file.

When QXvue receives order which is non-standard DICOM tag from the worklist server, QXvue will make it to standard DICOM file using DICOM tag converting function.

Worklist & PACS

1) Definition

- Incoming: Receiving tag from the worklist server
- Internal: Internally defined field name of the patient information and study order in QXvue
- Outgoing: DICOM tag that will be stored to DICOM file.

2) Worklist Matching

- Select internal field name and then currently matched tag will be displayed in the items table.
- Select incoming tag from the list and register it by clicking **<<** button.
- Select outgoing tag from the list and register it by clicking **>>** button.

File-worklist

- The format of file worklist should be text file and the field should be separated by delimiter.
- The delimiter is user-defined and should be registered in the **delimiter** table.
- Internally defined fields for patient information and study order are listed in the **internal field** table.
- Set the matching internal field name according to the text order in the worklist file.
- Internal field will be translated to the DICOM tag set at 3.1.2.
- The delimiter could be one or more characters.
- The date and time format used in worklist file can be selected, and all characters with star-closure (*) are ignored.

Date format

- YYYY: Year represented by full four digits
- MM: Month as digits with leading zero for single-digit months
- DD: Day of month as digits with leading zero for single-digit days

Time Format

- HH: Hours with leading zero for single-digit hours; 24-hour clock
- MM: Minutes with leading zero for single-digit minutes
- SS: Seconds with leading zero for single-digit seconds

6. Operation

	For the detailed operation, refer to the QXvue User Manual.

1 Please do the following steps.

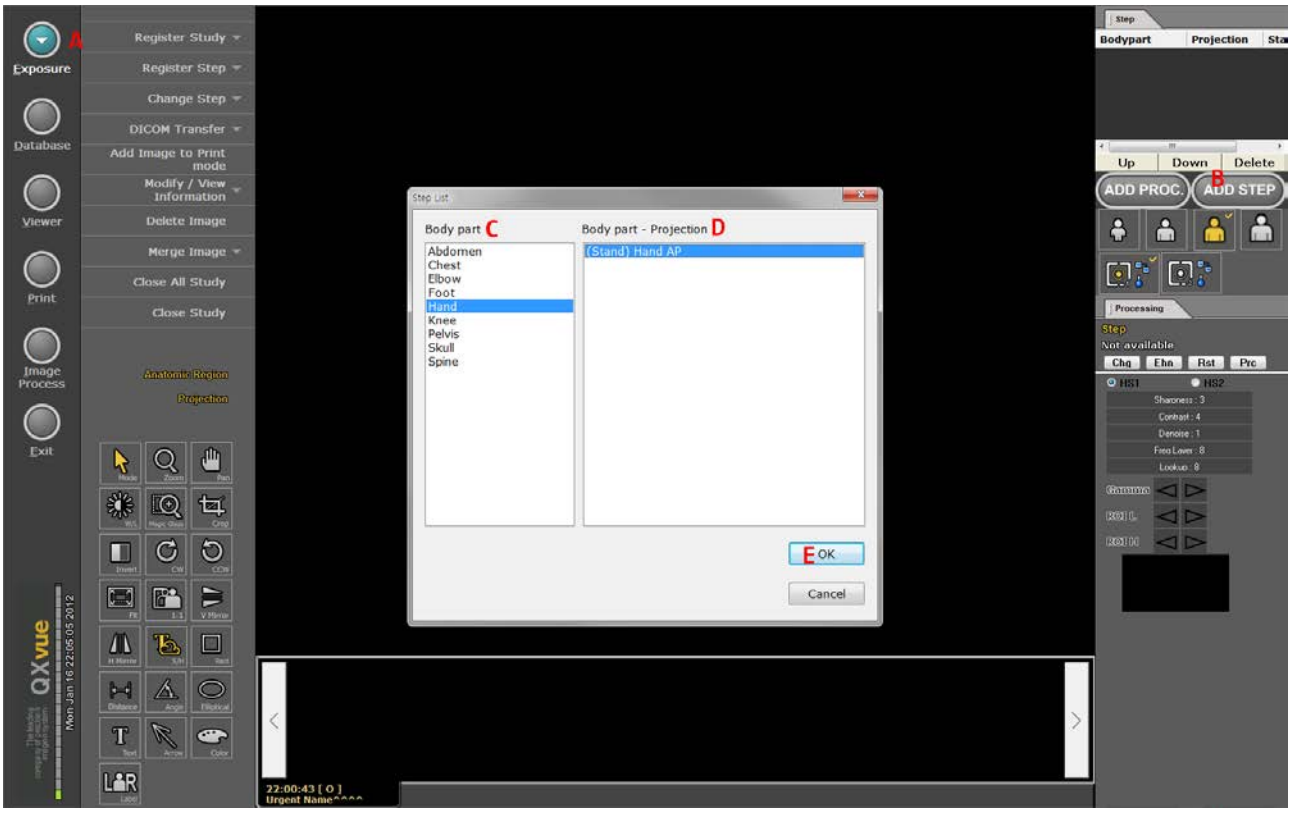
A Choose the **Exposure** tab.

B Click the **ADD STEP** button.

C Choose one of the body parts.

D Choose Body part – Projection.

E Click the **OK** button.

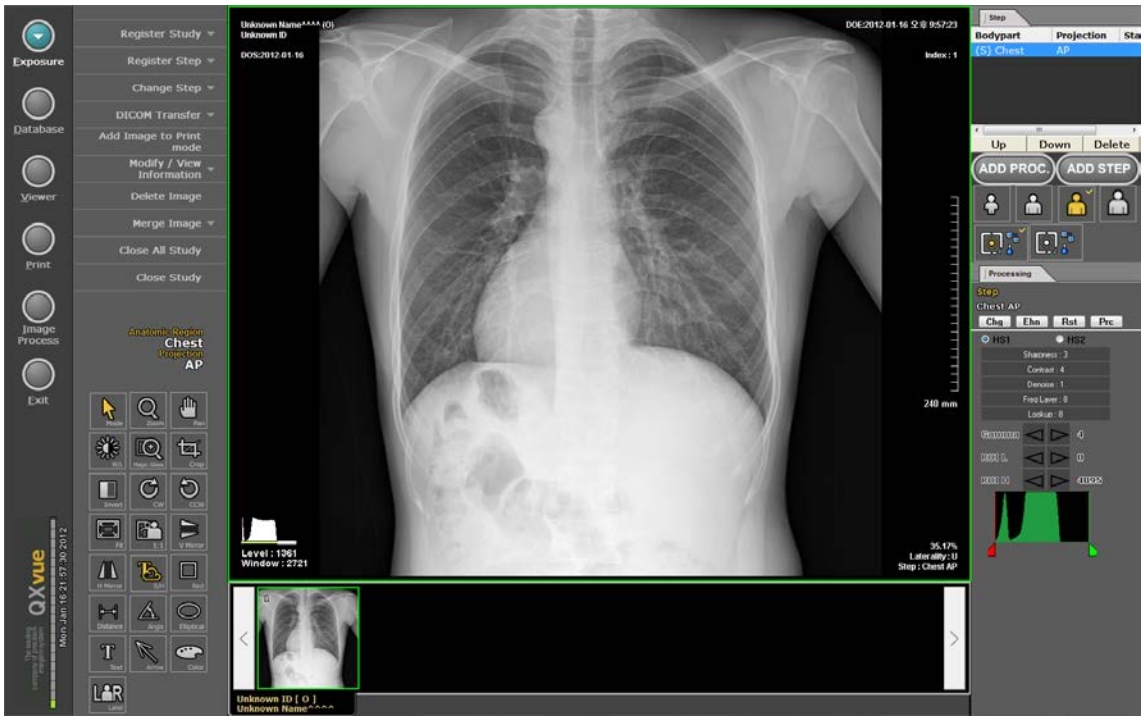


2 Arrange the patient in the correct position to have detector aligned with the target body part.

3 Position the X-ray generator to adjust the exposure field.

4 Adjust kVp and mAs for best condition depending on body part and projection.

5 Press the exposure switch of the X-ray generator. You can check the images on the monitor after image processing.



CAUTION	When power is not supplied to the detector, do not expose X-rays. Otherwise, afterimages may occur.

7. Maintenance

7.1 Function Test

Item	Period	Description
Power consumption	Daily	Confirm that the power operation of detector is normal.
Temperature	Daily	Check the monitoring in order to minimize the characteristic changes of Flat panel caused by external temperature changes.
Hard disk space	Daily	Check if the hard disk is enough to save images and allow the consecutive shootings.
Worklist connection	Daily	Check the worklist connection to allow consecutive shootings.
PACS server connection	Daily	Check the PACS server connection to send images.
Printing Test	Daily	Check the printer connection and print images
Auto offset	Daily	Check that Flat panel's offset changes caused by the increased heat are automatically corrected.
Resolution	Monthly	Confirm the resolution of the detector.
Image Acquisition Time	Monthly	Confirm the acquisition of time required to get image designed with optimal specifications.
Linearity	Quarterly	Evaluate the distinct characteristics of detector through the amount of radiation coming into Flat Panel Detector, resolution and contrast of images/projections, and the unification of noises of projection.
DQE	Quarterly	Evaluate the distinct characteristics of detector through the amount of radiation coming into Flat Panel Detector, resolution and contrast of images/projections, and the unification of noises of projection.
MTF	Quarterly	Evaluate the distinct characteristics of detector through the amount of radiation coming into Flat Panel Detector, resolution and contrast of images/projections, and the unification of noises of projection.
Calibration	Annually	Compensates defect pixels and calibrates pixel gain using the installed X-ray generator and X-ray tube.

7.2 Maintenance Guidelines for Users and Test Forms

Maintenance

If you have any inquiries about trouble shooting or the product seems to have a problem, please contact Vieworks. For optimal performance, we recommend that the working area be kept clean.

CAUTION	Federal law restricts this device to be dealt or operated by a physician or medical assistant.

Contact Information

Address: Vieworks Co., Ltd
#107-108, 601-610 Suntechcity II
52, Sagimakgol-ro (307-2 Sangdaewon-dong),
Jungwon-gu, Seongnam-si, Gyeonggi-do
462-806 South Korea
Phone: +82-70-7011-6161
Fax: +82-31-737-4954
email: vieworks@vieworks.com

Cleaning

Use a dry cloth to clean surfaces of the system. Do not use detergents or organic solvents to clean the system.

CAUTION	Do not use abrasive brush, scraper, or acid/alkaline cleaner when cleaning your product.

Test Forms

Test ITEM (1)	Power Consumption				
	Frequency	D: Daily	■	M: Monthly	□
		Q: Quarterly	□	A: Annually	□

Objective:

Confirm that the power operation of detector is normal.

Equipment:

Workstation, QXvue S/W

Detector, PSU/SCU

Inspection Report Form

Procedure:

Turn on the power of the system.

Run QXvue.

Read the data indicated by Power Meter.

Performance and Corrective Action:

Power Consumption of 12W ±10% is secured.

Light green colored LED should be turned on.

If the power consumption exceeds the tolerance limit, service assistance is necessary.

If the LED is not turned on, service assistance is necessary.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: 12W ±10%

Remarks:

Test ITEM (2)	Temperature		
	Frequency	D: Daily ■	M: Monthly □
		Q: Quarterly □	A: Annually □

Objective:

Check the monitoring in order to minimize the characteristic changes of Flat panel caused by external temperature changes.

Equipment:

Workstation, QXvue S/W

Detector, PSU/SCU

Inspection Report Form

Procedure:

Turn on the power of the system.

Run QXvue.

Login to Service Mode.

Check the temperature.

Performance and Corrective Action:

Confirm that the detector and ambient temperature is lower or higher than the operating temperature stated in this Service Manual. If the detector and ambient temperature deviates from the operating range, adjust the detector and ambient temperature properly to prevent poor image quality. If the image quality is reduced after adjusting the temperature, service assistance is necessary.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: +10 ~ +45℃ (Internal temperature of the detector)

Remarks:

Test ITEM (3)	Hard Disk free space				
	Frequency	D: Daily	■	M: Monthly	□
		Q: Quarterly	□	A: Annually	□

Objective:

Confirm that new study can be performed and stored to hard disk drive of workstation.

Equipment:

Workstation, QXvue S/W

Detector, PSU/SCU

Inspection Report Form

Procedure:

Turn on the power of the system.

Run QXvue.

Check hard disk free space indication is not red light.

Performance and Corrective Action:

If the hard disk free space indication is not red, new study can be performed.

If the hard disk free space indication is red, delete old study to make free hard disk space enough to perform new study.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: N/A

Remarks:

Test ITEM (4)	Worklist connection				
	Frequency	D: Daily	■	M: Monthly	□
		Q: Quarterly	□	A: Annually	□

Objective:

Confirm that QXvue is connected normally with Worklist and can register study by querying from Worklist server.

Equipment:

Workstation, QXvue S/W, Work List Server

Detector, PSU/SCU

Inspection Report Form

Procedure:

Turn on the power of the system.

Run QXvue.

Select Exposure Mode.

Select Registration Menu.

Select Worklist Menu.

Select Configure Menu.

Select Worklist server.

Click the Test button.

Performance and Corrective Action:

Check the connection status that is displayed in test result window.

If connection test failed, check Worklist server is operating and configuration of Worklist server connection is correct.

If still Worklist connection fails, service assistance is necessary.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: N/A

Remarks:

Test ITEM (5)	PACS Server connection		
	Frequency	D: Daily ■ M: Monthly □ Q: Quarterly □ A: Annually □	

Objective:

Confirm that QXvue is connected normally with PACS Server and can send performed study data to PACS server.

Equipment:

Workstation, QXvue S/W, PACS Server

Detector, PSU/SCU

Inspection Report Form

Procedure:

Turn on the power of the system.

Run QXvue.

Select Database Mode.

Select DICOM transfer Menu.

Select Configure Menu.

Select PACS Server.

Click the Test button.

Performance and Corrective Action:

Check the connection status that is displayed in test result window.

If connection test failed, check PACS server is operating and configuration of PACS server connection is correct.

If still PACS server connection fails, service assistance is necessary.

Record result on Inspection Report Form

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: N/A

Remarks:

Test ITEM (6)	Printing Test				
	Frequency	D: Daily	■	M: Monthly	□
		Q: Quarterly	□	A: Annually	□

Objective:

Confirm that QXvue is connected normally with Printer and can print images.

Equipment:

Workstation, QXvue S/W,

DICOM Printer or Paper Printer that is installed.

Detector, PSU/SCU

Inspection Report Form

Procedure:

Turn on the power of the system.

Run QXvue.

Select Database Mode.

Search database and open study.

Select Viewer mode.

Select image and click the **Add to Print mode** menu.

Print image.

Performance and Corrective Action:

Confirm that the image is printed normally.

If printing failed, check printer is operating and configuration of printer.

If still printing fail, service assistance is necessary.

Record result on Daily Report Form

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: N/A

Remarks:

Test ITEM (7)	Auto offset				
	Frequency	D: Daily	■	M: Monthly	□
		Q: Quarterly	□	A: Annually	□

Objective:

Check that Flat panel's offset changes caused by the increased heat are automatically corrected.

Equipment:

Workstation, QXvue S/W

Detector, PSU/SCU

Stop watch

Inspection Report Form

Procedure:

Turn on the power of the system.

Select: \QXvue Data\configure\Maxxvue.ini file.

Open Maxvue.ini file with the text viewer such as notepad.exe.

Set the time of OFFSET_REFRESH_TIME_IN_SEC= **** at [PRIMARY_DETECTOR_OPTION]

Set the time of OFFSET_REFRESH_TIME_IN_SEC=**** at [SECONDARY_DETECTOR_OPTION]

Run QXvue.

Performance and Corrective Action:

Check if Auto offset is set and performed when operating QXvue.

Check if Auto offset operates after the chosen time setting is over.

If offset is not set automatically and does not perform, ask for service assistance.

If the chosen time setting is exceeded, recheck the time setting.

If the image is not normal due to the dislocation of offset, send the image and ask for service assistance.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: N/A

Remarks:

Test ITEM (8)	Resolution		
	Frequency	D: Daily □	M: Monthly ■
		Q: Quarterly □	A: Annually □

Objective:

Confirm the resolution of the detector.

Equipment:

Workstation, QXvue S/W

Detector, PSU/SCU

Resolution Chart (Nuclear Associate, model 07-523-2 or Line pair CHART 0.05 ㎜ Pb CN37076)

X-ray GEN., X-ray Tube

Inspection Report Form

Procedure:

Turn on the power of the system.

Run QXvue.

Attach resolution chart (Line pair CHART 0.05 ㎜ Pb CN37076, model 07-523-2) on the center of the detector with diagonal direction.

Set X-ray generator to 50kVp, 2mAs and SID to 1m.

Expose X-rays.

Confirm that the resolution is over 3.5lp/㎜.

Performance and Corrective Action:

Confirm that the resolution is over 3.5lp/㎜.

If the resolution is under 3.5lp/㎜, then test again with adjusting mAs from 1mAs to 5mAs.

If still resolution is under 3.5lp/㎜, service assistance is necessary.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: 3. 5lp/㎜

Remarks:

Test ITEM (9)	Image Acquisition Time				
	Frequency	D: Daily	□	M: Monthly	■
		Q: Quarterly	□	A: Annually	□

Objective:

Confirm the acquisition of time required to get image designed with optimal specifications.

Equipment:

Workstation, QXvue S/W

Detector, PSU/SCU

X-ray GEN., X-ray Tube

Stop watch

Inspection Report Form

Procedure:

Turn on the power of the system.

Run QXvue.

Select Exposure Mode.

Register patient.

Expose X-rays with the condition of 50kVp and 5 mAs.

Check flat Image is acquired and displayed on monitor.

Performance and Corrective Action:

Check if the image is acquired in 5 to 6 seconds (including the processing time).

If image acquisition failed, check the X-ray is exposed normally and the triggering with X-ray generator is properly configured.

If still image acquisition fail, service assistance is necessary.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability:5~6 sec

Remarks:

Test ITEM (10)	Sensitivity		
	Frequency	D: Daily □	M: Monthly □
		Q: Quarterly ■	A: Annually □

Objective:

Evaluate the image quality according to the amount of radiation coming into Flat Panel Detector.

Equipment:

Workstation, QXvue S/W

Detector, PSU/SCU

X-ray GEN., X-ray Tube

Dose Meter

Inspection Report Form

Procedure:

No Target

Gain type: 1

Performance and Corrective Action:

For Gadox type, 2000±100G/L Graylevel properties/qualities should be obtained under 42uGy X-ray doses.

For CsI type, 2000±100G/L Graylevel properties/qualities should be obtained under 40uGy X-ray doses.

If properties/qualities are not obtained, reset the conditions and test again.

If properties/qualities are still not obtained after the second test, service assistance is necessary.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: Gadox Detector: 42uGy ➔ 2000±100 Graylevel

CsI Detector: 40uGy ➔ 2000±100 Graylevel

Remark:

Test ITEM (11)	DQE		
	Frequency	D: Daily □	M: Monthly □
		Q: Quarterly ■	A: Annually □

Objective:

Evaluate the distinct characteristics of detector through the amount of radiation coming into Flat Panel Detector, resolution and contrast of images/projections, and the unification of noises of projection.

Equipment:

Workstation, QXvue S/W

Detector, PSU/SCU

X-ray GEN., X-ray Tube

Inspection Report Form

Procedure:

IEC62220-1(RQA 5) in accordance with the conditions

Performance and Corrective Action:

In case of CSI type, properties/qualities should be obtained more than 45% at 1l/p ㎜.

In case of Gadox type, properties/qualities should be obtained more than 30% at 1l/p ㎜.

If properties/qualities are not obtained, reset the conditions and test again.

If properties/qualities are still not obtained after the second test, service assistance is necessary.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: CSI: 1l/p ㎜, more than 40%

Gadox: 1l/p ㎜, more than 30%

Remarks:

Test ITEM (12)	MTF		
	Frequency	D: Daily □	M: Monthly □
		Q: Quarterly ■	A: Annually □

Objective:

Evaluate the distinct characteristics of detector through the amount of radiation coming into Flat Panel Detector, resolution and contrast of images/projections, and the unification of noises of projection.

Equipment:

Workstation, QXvue S/W

D.Q.E Program (Matlab)

Detector, PSU/SCU

X-ray GEN., X-ray Tube

Inspection Report Form

Procedure:

IEC62220-1(RQA 5) in accordance with the conditions

Performance and Corrective Action:

Properties/qualities should be obtained more than 50% at 1l/p ㎜.

If properties/qualities are not obtained, reset the conditions and test again.

If properties/qualities are still not obtained after the second test, service assistance is necessary.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: 1l/p ㎜, more than 50%

Remarks:

Test ITEM (13)	Calibration		
	Frequency	D: Daily □	M: Monthly □
		Q: Quarterly □	A: Annually ■

Objective:

Compensates defect pixels and calibrates pixel gain using the installed x-ray generator and x-ray tube.

Equipment:

Workstation, ChameleonSetup S/W

Detector, PSU/SCU

X-ray GEN., X-ray Tube

Inspection Report Form

Procedure:

Turn on the power of the system.

Run ChameleonSetup.

Operation of calibration: Enter 10 in the Stage of Preoffset and perform the calibration.

Operation of calibration: Enter 10 in the Stage of Postoffset and perform the calibration.

Operation of calibration: Perform Defect detection.

Operation of calibration: Perform Gain correction.

Performance and Corrective Action:

Featured artifacts are not found if calibration is performed normally.

If many artifacts are found, perform calibration again.

If many artifacts are still found, service assistance is necessary.

Record result on Inspection Report Form.

Result:

Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**-** Operator:

Limit of Acceptability: N/A

Remarks:

System Discrepancy Form

Installation Site Information: _____

_____

Date: _____ Published by: _____

System Information

X-ray Generator: _____

X-ray Tube: _____

X-ray grid Information: _____

Detector Model: _____

Serial Number of Detector: _____

Serial Number of Power Supply Unit: _____

Version of QXvue: _____

Version of ChameleonSetup: _____

Version of Configure: _____

Version of QXvueConfigure_DICOM: _____

Comment: _____

System Discrepancy

Date of finding: _____

Operator: _____

How is it found: _____

_____

_____

_____

Comment: _____

_____

Contact Information

Address: Vieworks Co., Ltd
#107-108, 601-610 Suntechcity II,
52, Sagimakgol-ro (307-2 Sangdaewon-dong),
Jungwon-gu, Seongnam-si, Gyeonggi-do
462-806 South Korea

Phone: +82-70-7011-6161

Fax: +82-31-737-4954

email: vieworks@vieworks.com

Modification Request Form

Date: _____ Published by: _____

System Information

X-ray Generator: _____

X-ray Tube: _____

X-ray grid Information: _____

Detector Model:_____

Serial Number of Detector: _____

Serial Number of Power Supply Unit: _____

Version of QXvue: _____

Version of ChameleonSetup: _____

Version of Configure: _____

Version of QXvueConfigure_DICOM: _____

Comment: _____

Modification Request

Software Name:

Request: _____

_____

_____

_____

Comment: _____

_____

Contact Information

Address: Vieworks Co., Ltd
#107-108, 601-610 Suntechcity II,
52, Sagimakgol-ro (307-2 Sangdaewon-dong),
Jungwon-gu, Seongnam-si, Gyeonggi-do
462-806 South Korea

Phone: +82-70-7011-6161

Fax: +82-31-737-4954

email: vieworks@vieworks.com

8. Troubleshooting

Trouble shooting must be performed by technician who is trained by the Vieworks Co., Ltd or an organization certified by Vieworks Co., Ltd.
If an unqualified person performs troubleshooting on the system resulting in damaging the detector, software or hardware, then the Vieworks Co., Ltd or its representative is not responsible for the detector repair regardless of remain warranty.
For more detailed information, refer to the 9. Warranty section.

8.1 Failure Case

Failure Case	Solution
Failed to turn on the power of SCU.	Refer to 8.1.1
Power LED isn't lit up.	Refer to 8.1.2
Status LED isn't lit up with green.	Refer to 8.1.3
Communication Test Failure	Refer to 8.1.4
Vertical line noise occurs.	Refer to 8.1.5
Failed to acquire an image.	Refer to 8.1.6
Images are acquired continuously.	Refer to 8.1.7

8.1.1 Repairing PSU or SCU

Check if AC power cable of Power Supply Unit or System Control Unit is securely plugged. If it still does not work, replace the PSU or SCU.

8.1.2 Repairing Power Failure

Check if DC power cable is properly connected in FXRD-1717SA/B and Ether Con cable is properly connected in FXRD-1417SA/B. Also, check if power switch is turned on. If it still does not work normally, do the next steps in order.

- FXRD-1717SA/B
  - ① Replace the DC 15 m cable.
  - ② Replace the PSU.
  - ③ Replace the detector.

- FXRD-1417SA/B
  - ① Replace the Ether Con cable.
  - ② Replace the SCU.
  - ③ Replace the detector's cable.
  - ④ Replace the detector.

8.1.3 Configuration Failure

Turn off the PSU or SCU and turn it on again. If it still does not work, replace the detector.

8.1.4 Repairing Communication Failure

Check if LAN cable is securely plugged. If it still does not work normally, do the next steps in order.

① Restart QXvue.
② When QXvue is abnormally stopped, manually exit QXvue in the task manager.
③ Turn off the PSU or SCU and turn it on again.
④ Check the Windows Firewall (Need to be Disabled)
⑤ Check Gigabit LAN Card Configuration.
⑥ Check IP settings.
⑦ Replace the LAN cable.
⑧ Replace the Gigabit LAN Card.
⑨ Replace the detector or SCU.

8.1.5 Repairing Image Noise

If 12 horizontal lines appear in the image, do the next steps in order.

- AED Mode
  ① Check if X-rays are exposed in the direction of the detector.
  ② Check if the Debounce_AED value is set to less than 7.
  ③ Check if the KV value of X-ray generator is not set to lower than normal.
  ④ If the object is thick, set the KV value higher than normal.

- DR Trigger Mode
  ① Check if the generator is set to the Line Trigger Handshaking mode.
  ② If it is delayed more than 100 ㎳ while exposing X-rays from the generator, input the measured delay time into Pre Exposure Section of ChameleonSetup.
  ③ If the Line Trigger Handshaking mode does not work normally, use Passive Trigger or AED mode instead.

If image noise appears randomly, do the next steps in order.

① Turn off PSU or SCU and turn it on again.

② If there is electromagnetic equipment around the detector, turn it off or move it to another place.

③ Connect the ground terminal of the detector or SCU to the ground using the ground wire.

④ If noise still appears terribly, replace the detector.

8.1.6 Repairing failure to acquire an image

If you failed to acquire an image after turning on the detector, do the next steps in order.

① Check if communication between QXvue and detector is normal.

② Check if an image is acquired by performing Normal Grab in Diagnosis of ChameleonSetup.

③ Check if the generator's bucky settings match the detector's acquisition mode.

④ Check if DR (Line) Trigger Mode is connected as described in 2.4.4 Input and Output Circuits.

⑤ Replace the generator interface cable (15 m).

⑥ Check the followings in case of AED Mode.

- Check if Collimator of X-ray generator is open.
- Check if X-ray exposure is headed for the center of the detector.
- Check if the Debounce_AED value is set to less than 7.
- If the object is thick, set the KV value higher than normal.
- Place dose-meter or scintillator on the surface of the detector and acquire an image, then check if X-rays are exposed.
- If you failed to acquire an image, change to DR (Line) Trigger. If it is not allowed to do in the current environment, replace the detector.

⑦ If you succeed to acquire an image after replacing detector, the previous one is surely defective.

8.1.7 Repairing failure to acquire images continuously

If images are acquired continuously or periodically without having to expose X-rays in AED mode, do the next steps in order.

① Turn off detector or SCU and turn it on again.

② Set the Debounce_AED value to 7 ㎳ in ChameleonSetup.

③ Change to DR (Line) Trigger Mode. If it is not allowed to do in the current environment, replace the detector.

9. Warranty

Vieworks Co., Ltd warrants that this product will be free from defects in materials and workmanship for a period of twelve (12) months from the date of delivery. If any such product proves defective during this warranty period, Vieworks Co., Ltd at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. In order to obtain service under this warranty, Customer must notify Vieworks Co., Ltd of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Vieworks Co., Ltd with shipping charges prepaid. Vieworks Co., Ltd shall pay for the return of the product to customer if the shipment is to a location within the country in which the Vieworks Co., Ltd designated service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure, or damage caused by improper or inadequate maintenance and care. Vieworks shall not be obligated to furnish service under this warranty to repair damage resulting from attempts by personnel other than Vieworks Co., Ltd or its representatives to install, repair, or service this product, to repair damage resulting from improper use or connection to incompatible equipment or power source; or to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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There are no warranties which extend beyond the description mentioned in this document.

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